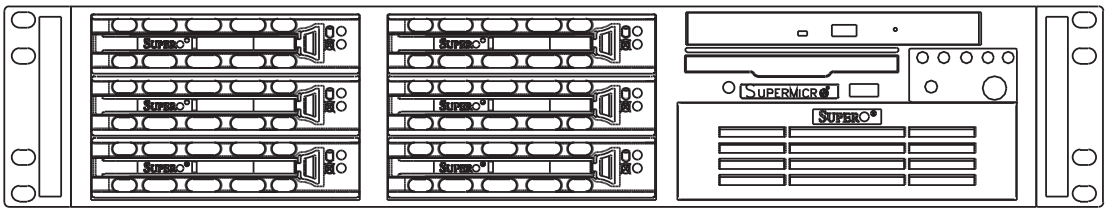
SUPERO®

SUPERSERVER 5025B-4
SUPERSERVER 5025B-T



USER'S MANUAL

1.0

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Preface

About This Manual

This manual is written for professional system integrators and PC technicians. It provides information for the installation and use of the SuperServer 5025B-4/5025B-T. Installation and maintainance should be performed by experienced technicians only.

The SuperServer 5025B-4/5025B-T is a high-end, single Intel® Xeon processor server based on the SC822S-400LP/SC822TQ-400LP 2U rackmount server chassis and the X7SB4/X7SBE motherboard, which supports single Intel® Xeon 3200/3000 Series processors. Refer to the motherboard specifications pages on our web site for updates on supported processors.

Manual Organization

Chapter 1: Introduction

The first chapter provides a checklist of the main components included with the server system and describes the main features of the X7SB4/X7SBE motherboard and the SC822S-400LP/SC822TQ-400LP chassis, which make up the SuperServer 5025B-4/5025B-T.

Chapter 2: Server Installation

This chapter describes the steps necessary to install the SuperServer 5025B-4/5025B-T into a rack and check out the server configuration prior to powering up the system. If your server was ordered without processor and memory components, this chapter will refer you to the appropriate sections of the manual for their installation.

Chapter 3: System Interface

Refer here for details on the system interface, which includes the functions and information provided by the control panel on the chassis as well as other LEDs located throughout the system.

Chapter 4: System Safety

You should thoroughly familiarize yourself with this chapter for a general overview of safety precautions that should be followed when installing and servicing the SuperServer 5025B-4/5025B-T.

Chapter 5: Advanced Motherboard Setup

Chapter 5 provides detailed information on the X7SB4/X7SBE motherboard, including the locations and functions of connectors, headers and jumpers. Refer to this chapter when adding or removing processors or main memory and when reconfiguring the motherboard.

Chapter 6: Advanced Chassis Setup

Refer to Chapter 6 for detailed information on the SC822S-400LP/SC822TQ-400LP 2U server chassis. You should follow the procedures given in this chapter when installing, removing or reconfiguring SATA or peripheral drives and when replacing the system power supply unit and cooling fans.

Chapter 7: BIOS

The BIOS chapter includes an introduction to BIOS and provides detailed information on running the CMOS Setup Utility.

Appendix A: BIOS POST Messages

Appendix B: BIOS POST Codes

Appendix C: System Specifications

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Appendix C Intel HostRAID Setup Guidelines

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Chapter 1

Introduction

1-1 Overview

The SuperServer 5025B-4/5025B-T is a high-end, 2U rackmount server that features some of the most advanced technology currently available. The SuperServer 5025B-4/5025B-T is comprised of two main subsystems: the SC822S-400LP/SC822TQ-400LP 2U chassis and the X7SB4/X7SBE Xeon processor motherboard. Please refer to our web site for information on operating systems that have been certified for use with the SuperServer 5025B-4/5025B-T. (www.supermicro.com).

In addition to the motherboard and chassis, various hardware components may have been included with your SuperServer 5025B-4/5025B-T, as listed below:

- One (1) 3.5" floppy drive (FPD-PNSC-01)
- Four (4) chassis cooling fans (FAN-0044)
- One (1) rackmount kit (CSE-PT25)
- SCSI Accessories (5025B-4 only):

  Six (6) SCA drive carriers (CSE-PT17-B)

  One (1) SCA SAF-TE compliant SCSI backplane (CSE-SCA-822S)

  One (1) internal 68-pin Ultra320/160 SCSI cable (CBL-033L-U320)
- SATA Accessories (5025B-T only):

  Six (6) SATA hard drive carriers (CSE-PT17B)
  One (1) SATA backplane (BPN-SAS-823TQ-O-P)
  Two (2) SGPIO cables (CBL-0157L)
  Three (3) SATA data cables (CBL-0061L)
  Three (3) SATA data cables (CBL-0178L)
- One (1) active heatsink, optional (SNK-P0015A4)
- One (1) IDE/SATA port adapter (CDM-PSATA, see Section 6-4)
- One (1) CD containing drivers and utilities
- SuperServer 5025B-4/5025B-T User's Manual

1-2 Motherboard Features

At the heart of the SuperServer 5025B-4/5025B-T lies the X7SB4/X7SBE, a single Intel Xeon processor motherboard designed to provide maximum performance. Below are the main features of the X7SB4/X7SBE. (See Figure 1-1 for a block diagram of the chipset.)

Processors

The X7SB4/X7SBE supports single Intel Xeon 3200/3000 Series LGA775 processors at system bus speeds of 1333, 1066 and 800 MHz. Please refer to the motherboard specifications pages on our web site for updates on supported processors.

Memory

The X7SB4/X7SBE has four 240-pin DIMM slots that can support up to 8 GB of unbuffered ECC DDR2-800/667 SDRAM.

Onboard SCSI (5025B-4 only)

Onboard SCSI is provided with an Adaptec AIC-7901 SCSI controller chip, which supports dual channel, Ultra320 SCSI at a burst throughput rate of 320 MB/sec. The X7SB4 provides one SCSI port. **Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SCSI drives.

Onboard SATA

A SATA controller is built in to the ICH9R portion of the chipset to provide support for a six port, 3 Gb/sec Serial ATA subsystem, which is RAID 0, 1, 5 and 10 supported. The SATA drives are hot-swappable units. **Note:** The operating system you use must have RAID support to enable the hot-swap capability and RAID function of the SATA drives.

PCI Expansion Slots

The X7SB4/X7SBE has one PCI-Express x8 slot, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots and two 64-bit 100 MHz PCI-X slots (one functions as a ZCR slot for the X7SB4). An IPMI slot is also included on the board.

ATI Graphics Controller

The X7SB4/X7SBE features an integrated ATI video controller based on the ES1000 32 MB graphics chip. The ES1000 was designed specifically for servers, featuring low power consumption, high reliability and superior longevity.

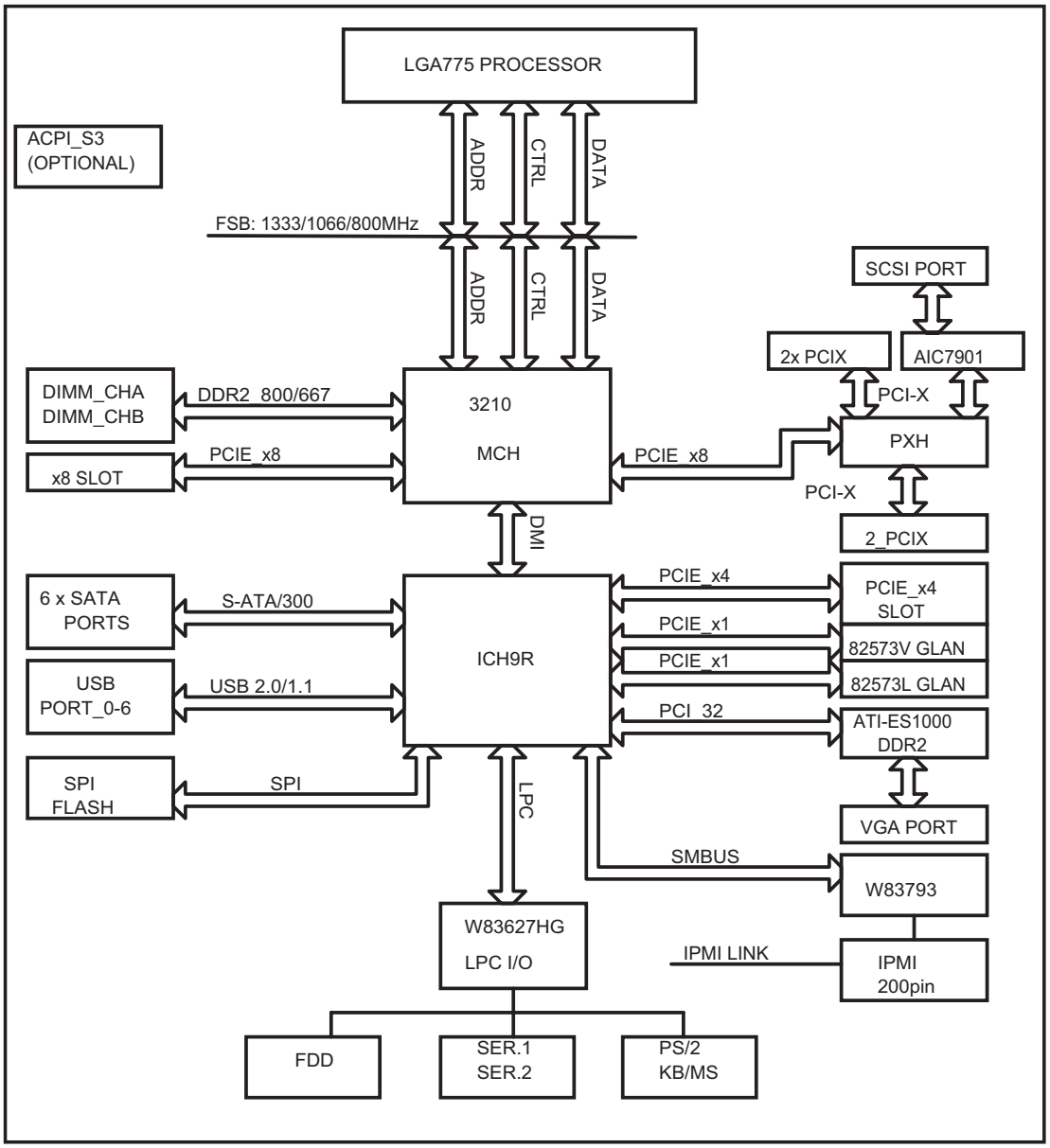
Onboard Controllers/Ports

The X7SB4/X7SBE includes a floppy drive controller and backpanel I/O ports that include one COM port, two USB ports, PS/2 mouse and keyboard ports, a video (monitor) port and dual Gigabit Ethernet LAN ports. A second COM port is available as an onboard header. The X7SB4 also includes a SCSI port.

Other Features

Other onboard features are included to promote system health. These include various voltage monitors, a CPU temperature sensor, fan speed sensors, a chassis intrusion header, auto-switching voltage regulators, chassis and CPU overheat sensors, virus protection and BIOS rescue.

Figure 1-1. Intel 3210 Chipset: System Block Diagram



Note: This is a general block diagram. Please see Chapter 5 for details. (SCSI is included on the X7SB4 only.)

1-3 Server Chassis Features

The following is a general outline of the main features of the SC822S-400LP/SC822TQ-400LP chassis.

System Power

When configured as the 5025B-4/5025B-T, the SC822S-400LP/SC822TQ-400LP chassis includes a single 400W power supply.

SCSI Subsystem (5025B-4 only)

The SCSI subsystem supports six 80-pin SCA Ultra320 SCSI hard drives. (Any standard 1" drives are supported. SCA = Single Connection Attachment.) The SCSI drives are connected to an SCA backplane that provides power, bus termination and configuration settings. The SCSI drives are also hot-swap units.

Control Panel

The SC822S-400LP/SC822TQ-400LP control panel provides important system monitoring and control information. LEDs indicate power on, network activity, hard disk drive activity and system overheat conditions. Also present are a main power button and a system reset button.

I/O Backplane

The backplane of the SC822S-400LP/SC822TQ-400LP supports the use of up to seven low-profile expansion cards and provides one COM port, one VGA port, two USB ports, PS/2 mouse and keyboard ports and two Gb Ethernet (LAN) ports.

Cooling System

The SC822S-400LP/SC822TQ-400LP chassis has a revolutionary cooling design that includes four 8-cm system cooling fans. The fans plug into chassis fan connectors that are located behind the drive bays. A "Fan Speed Control Mode" setting in BIOS allows the user to set the chassis fan speed (recommended setting is "3-pin Server)". If any fan fails and the ambient air temperature inside the chassis becomes too high, an overheat LED and alarm will be activated.

1-4 Contacting Supermicro

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Web Site:	www.supermicro.com.tw
Technical Support:	
Email:	support@supermicro.com.tw
Tel:	886-2-8228-1366, ext.132 or 139

Chapter 2

Server Installation

2-1 Overview

This chapter provides a quick setup checklist to get your SuperServer 5025B-4/5025B-T up and running. Following these steps in the order given should enable you to have the system operational within a minimum amount of time. This quick setup assumes that your SuperServer 5025B-4/5025B-T system has come to you with the processors and memory preinstalled. If your system is not already fully integrated with a motherboard, processors, system memory etc., please turn to the chapter or section noted in each step for details on installing specific components.

2-2 Unpacking the System

You should inspect the box the SuperServer 5025B-4/5025B-T was shipped in and note if it was damaged in any way. If the server itself shows damage you should file a damage claim with the carrier who delivered it.

Decide on a suitable location for the rack unit that will hold the SuperServer 5025B-4/5025B-T. It should be situated in a clean, dust-free area that is well ventilated. Avoid areas where heat, electrical noise and electromagnetic fields are generated. You will also need it placed near a grounded power outlet. Read the Rack and Server Precautions in the next section.

2-3 Preparing for Setup

The box the SuperServer 5025B-4/5025B-T was shipped in should include two sets of rail assemblies, two rail mounting brackets and the mounting screws you will need to install the system into the rack. Follow the steps in the order given to complete the installation process in a minimum amount of time. Please read this section in its entirety before you begin the installation procedure outlined in the sections that follow.

Choosing a Setup Location

- Leave enough clearance in front of the rack to enable you to open the front door completely (~25 inches) and approximately 30 inches of clearance in the back of the rack to allow for sufficient airflow and ease in servicing.
- This product is for installation only in a Restricted Access Location (dedicated equipment rooms, service closets and the like).
- This product is not suitable for use with visual display work place devices acccording to §2 of the the German Ordinance for Work with Visual Display Units.

Warnings and Precautions!

Rack Precautions

- Ensure that the leveling jacks on the bottom of the rack are fully extended to the floor with the full weight of the rack resting on them.
- In single rack installation, stabilizers should be attached to the rack. In multiple rack installations, the racks should be coupled together.
- Always make sure the rack is stable before extending a component from the rack.
- You should extend only one component at a time - extending two or more simultaneously may cause the rack to become unstable.

Server Precautions

- Review the electrical and general safety precautions in Chapter 4.
- Determine the placement of each component in the rack *before* you install the rails.
- Install the heaviest server components on the bottom of the rack first, and then work up.
- Use a regulating uninterruptible power supply (UPS) to protect the server from power surges, voltage spikes and to keep your system operating in case of a power failure.

- Allow the hot plug SATA drives and power supply modules to cool before touching them.

- Always keep the rack's front door and all panels and components on the servers closed when not servicing to maintain proper cooling.

Rack Mounting Considerations

Ambient Operating Temperature

If installed in a closed or multi-unit rack assembly, the ambient operating temperature of the rack environment may be greater than the ambient temperature of the room. Therefore, consideration should be given to installing the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature (Tmra).

Reduced Airflow

Equipment should be mounted into a rack so that the amount of airflow required for safe operation is not compromised.

Mechanical Loading

Equipment should be mounted into a rack so that a hazardous condition does not arise due to uneven mechanical loading.

Circuit Overloading

Consideration should be given to the connection of the equipment to the power supply circuitry and the effect that any possible overloading of circuits might have on overcurrent protection and power supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Ground

A reliable ground must be maintained at all times. To ensure this, the rack itself should be grounded. Particular attention should be given to power supply connections other than the direct connections to the branch circuit (i.e. the use of power strips, etc.).

2-4 Installing the System into a Rack

This section provides information on installing the SuperServer 5025B-4/5025B-T into a rack unit. If the 5025B-4/5025B-T has already been mounted into a rack, you can skip ahead to Sections 2-5 and 2-6.

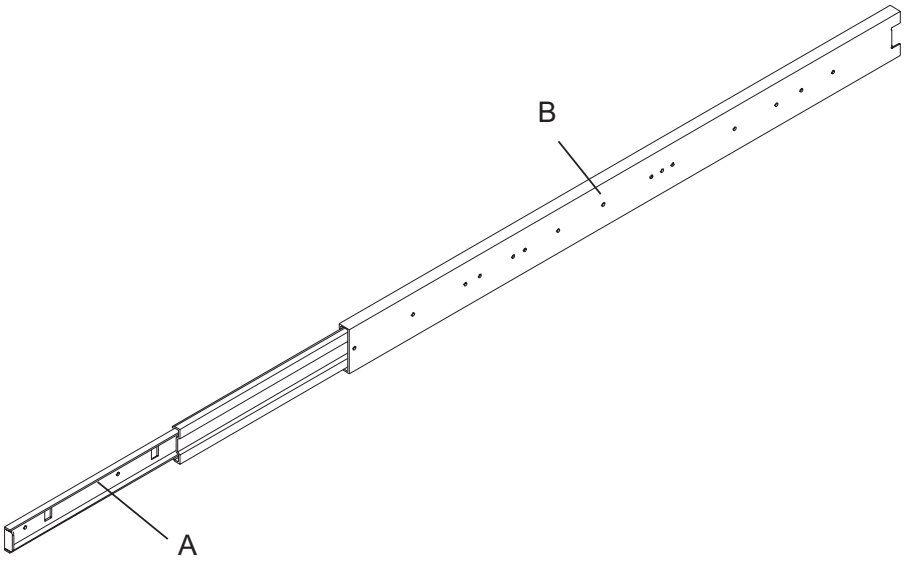
There are a variety of rack units on the market, which may mean the assembly procedure will differ slightly. The following is a guideline for installing the 5025B-4/5025B-T into a rack with the rack rails provided. You should also refer to the installation instructions that came with the rack unit you are using.

Identifying the Sections of the Rack Rails

You should have received two rack rail assemblies with the SuperServer 5025B-4/5025B-T. Each of these assemblies consist of three sections: an inner fixed chassis rail that secures to the 5025B-4/5025B-T (A) and an outer fixed rack rail that secures directly to the rack itself (B). A sliding rail guide sandwiched between the two should remain attached to the fixed rack rail (see Figure 2-1). The A and B rails must be detached from each other to install.

To remove the fixed chassis rail (A), pull it out as far as possible - you should hear a "click" sound as a locking tab emerges from inside the rail assembly and locks the inner rail. Then depress the locking tab to pull the inner rail completely out. Do this for both the left and right side rack rail assemblies.

Figure 2-1. Identifying the Sections of the Rack Rails



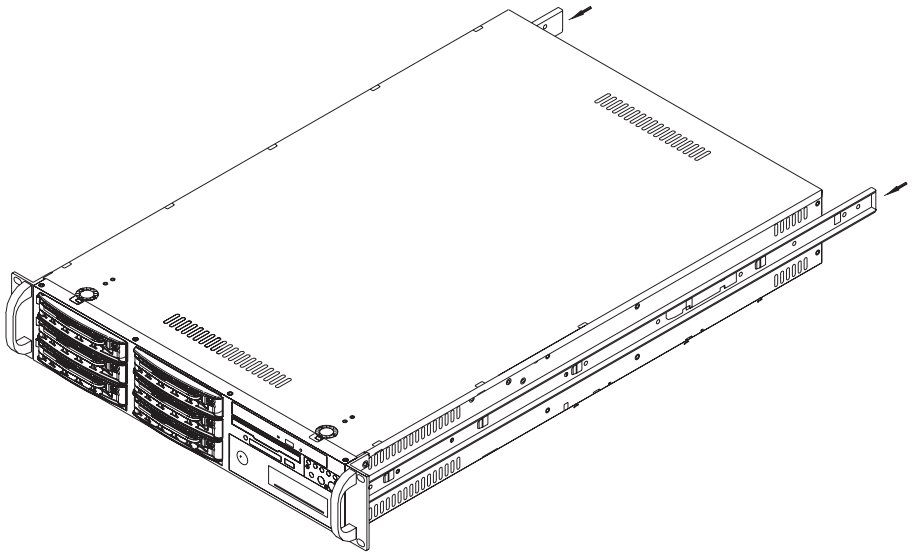
Installing the Chassis Rails

Position one of the fixed chassis rail sections you just removed along the side of the 5025B-4/5025B-T. Note that these two rails are left/right specific. Slide the rail toward the front of the chassis (see arrows in Figure 2-2) until you hear them click into place with the retention hooks on the chassis. The screw holes should now be aligned - screw the rail securely to the side of the chassis (see Figure 2-2).

Repeat this procedure for the other rail on the other side of the chassis. You will also need to attach the rail brackets when installng into a telco rack.

Locking Tabs: As you have seen, both chassis rails have a locking tab, which serves two functions. The first is to lock the server into place when installed and pushed fully into the rack, which is its normal position. Secondly, these tabs also lock the server in place when fully extended from the rack. This prevents the server from coming completely out of the rack when you pull it out for servicing.

Figure 2-2. Installing Chassis Rails



Installing the Rack Rails

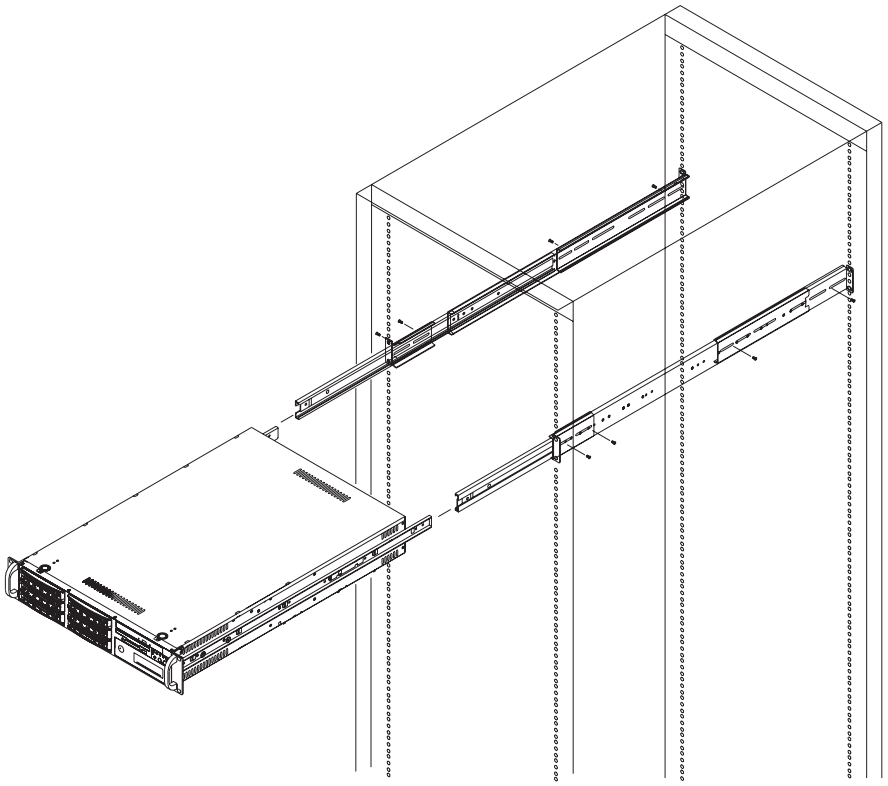
Determine where you want to place the SuperServer 5025B-4/5025B-T in the rack. (See Rack and Server Precautions in Section 2-3.) Position the fixed rack rail/sliding rail guide assemblies at the desired location in the rack, keeping the sliding rail guide facing the inside of the rack. Screw the assembly securely to the rack using the brackets provided. Attach the other assembly to the other side of the rack, making sure both are at the exact same height and with the rail guides facing inward.

Installing the Server into the Rack

You should now have rails attached to both the chassis and the rack unit. The next step is to install the server into the rack. Do this by lining up the rear of the chassis rails with the front of the rack rails. Slide the chassis rails into the rack rails, keeping the pressure even on both sides (you may have to depress the locking tabs when inserting). See Figure 2-3.

When the server has been pushed completely into the rack, you should hear the locking tabs "click". Finish by inserting and tightening the thumbscrews that hold the front of the server to the rack.

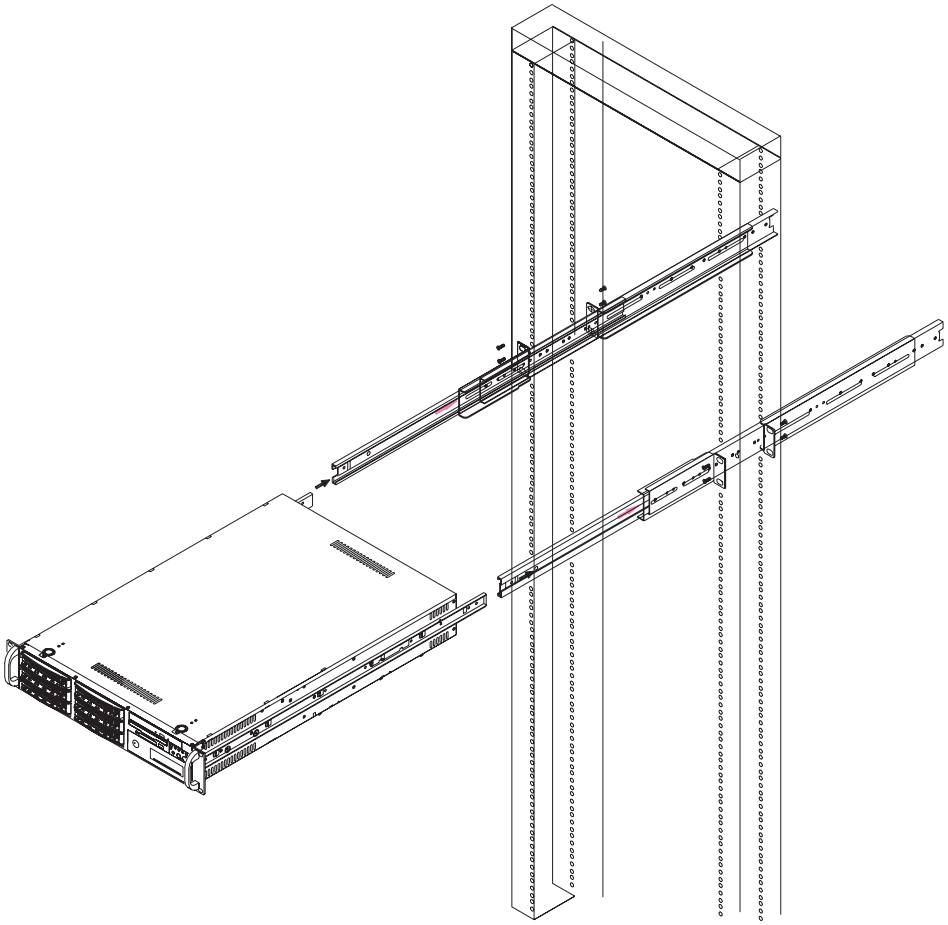
Figure 2-3. Installing the Server into a Rack



Installing the Server into a Telco Rack

If you are installing the SuperServer 5025B-4/5025B-T into a Telco type rack, follow the directions given on the previous pages for rack installation. The only difference in the installation procedure will be the positioning of the rack brackets to the rack. They should be spaced apart just enough to accommodate the width of the telco rack.

Figure 2-4. Installing the Server into a Telco Rack



2-5 Checking the Motherboard Setup

After you install the 5025B-4/5025B-T in the rack, you will need to open the unit to make sure the motherboard is properly installed and all the connections have been made.

Accessing the Inside of the System

1. Release the retention screws that secure the unit to the rack.

2. Grasp the two handles on either side and pull the unit straight out until it locks (you will hear a "click").

3. Depress the two buttons on the top of the chassis to release the top cover.

4. There is a large rectangular recess in the middle front of the top cover to help you push the cover away from you until it stops. You can then lift the top cover from the chassis to gain full access to the inside of the server. See Figure 2-5.

Checking the Components and Setup

1. You should have one processor already installed into the motherboard. The processor needs a heatsink installed. See Chapter 5 for instructions on processor and heatsink installation.

2. Your 5025B-4/5025B-T server system may have come with system memory already installed. Make sure all DIMMs are fully seated in their slots. For details on adding system memory, refer to Chapter 5.

3. If desired, you can install add-on cards to the system. See Chapter 5 for details on installing PCI add-on cards.

4. Make sure all power and data cables are properly connected and not blocking the chassis airflow. Also make sure that no cables are positioned in front of the fans. See Chapter 5 for details on cable connections.

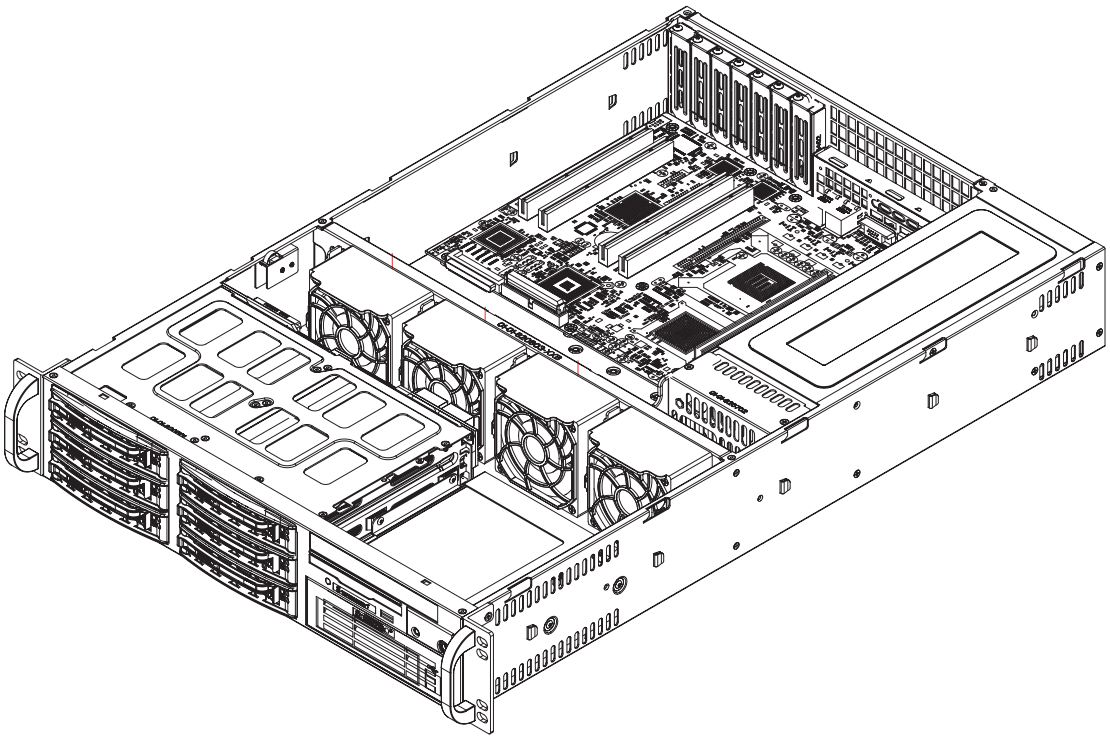


Figure 2-5. Accessing the Inside of the System

2-6 Checking the Drive Bay Setup

Next, you should check to make sure the peripheral drives and the SCSI/SATA drives and backplanes have been properly installed and all connections have been made.

Checking the Drives

1. All drives are accessable from the front of the server. For servicing the CD-ROM and floppy drives, you will need to remove the top chassis cover. The SCSI/SATA disk drives can be installed and removed from the front of the chassis without removing the top chassis cover.

2. A slim CD-ROM and a floppy drive should be preinstalled in your server. Refer to Chapter 6 if you need to reinstall a CD-ROM and/or floppy disk drive to the system.

3. Depending upon your system's configuration, your system may have one or more drives already installed. If you need to install SCSI/SATA drives, please refer to Chapter 6.

Checking the Airflow

1. Airflow is provided by four 8-cm fans. The system component layout was carefully designed to direct sufficient cooling airflow to the components that generate the most heat.

2. Note that all power and data cables have been routed in such a way that they do not block the airflow generated by the fans.

Supplying Power to the System

1. The last thing you must do is to provide input power to the system. Plug the power cord from the power supply unit into a high-quality power strip that offers protection from electrical noise and power surges.

2. It is recommended that you use an uninterruptible power supply (UPS).

Chapter 3

System Interface

3-1 Overview

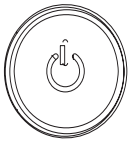
There are several LEDs on the control panel as well as others on the SCSI/SATA drive carriers and the motherboard to keep you constantly informed of the overall status of the system as well as the activity and health of specific components. There are also two buttons on the chassis control panel.

3-2 Control Panel Buttons

There are two push-buttons located on the front of the chassis. These are (in order from left to right) a reset button and a power on/off button.

Reset

Use the reset button to reboot the system.



Power

This is the main power button, which is used to apply or turn off the main system power. Turning off system power with this button removes the main power but keeps standby power supplied to the system.

3-3 Control Panel LEDs

The control panel located on the front of the SC822S-400LP/SC822TQ-400LP chassis has five LEDs. These LEDs provide you with critical information related to different parts of the system. This section explains what each LED indicates when illuminated and any corrective action you may need to take.

Overheat/Fan Fail

When this LED flashes it indicates a fan failure. When on continuously (on and not flashing) it indicates an overheat condition, which may be caused by cables obstructing the airflow in the system or the ambient room temperature being too warm. Check the routing of the cables and make sure all fans are present and operating normally. You should also check to make sure that the chassis covers are installed. Finally, verify that the heatsinks are installed properly (see Chapter 5). This LED will remain flashing or on as long as the overheat condition exists.

NIC2

NIC2

Indicates network activity on LAN2 when flashing.

NIC1

NIC1

Indicates network activity on LAN1 when flashing.

HDD

On the SuperServer 5025M-4, this LED indicates CD-ROM drive activity when flashing.

Power

Indicates power is being supplied to the system's power supply units. This LED should normally be illuminated when the system is operating.

3-4 Drive Carrier LEDs

SCSI Drives (5025M-4)

- **Green:** When illuminated, the green LED on the front of the SCSI drive carrier indicates drive activity. A connection to the SCSI SCA backplane enables this LED to blink on and off when that particular drive is being accessed.

- **Red:** A SAF-TE compliant backplane is needed to activate the red LED, which indicates a drive failure. (A SAF-TE compliant SCSI backplane is standard on the 5025M-4.) If one of the SCSI drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SCSI drives.

SATA Drives (5025M-T)

- **Green:** Each Serial ATA drive carrier has a green LED. When illuminated, this green LED (on the front of the SATA drive carrier) indicates drive activity. A connection to the SATA backplane enables this LED to blink on and off when that particular drive is being accessed. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

- **Red:** The red LED to indicate an SATA drive failure. If one of the SATA drives fail, you should be notified by your system management software. Please refer to Chapter 6 for instructions on replacing failed SATA drives.

Notes

Chapter 4

System Safety

4-1 Electrical Safety Precautions

Basic electrical safety precautions should be followed to protect yourself from harm and the SuperServer 5025B-4/5025B-T from damage:

- Be aware of the locations of the power on/off switch on the chassis as well as the room's emergency power-off switch, disconnection switch or electrical outlet. If an electrical accident occurs, you can then quickly remove power from the system.

- Do not work alone when working with high voltage components.

- Power should always be disconnected from the system when removing or installing main system components, such as the serverboard, memory modules and floppy drive. When disconnecting power, you should first power down the system with the operating system first and then unplug the power cords of all the power supply units in the system.

- When working around exposed electrical circuits, another person who is familiar with the power-off controls should be nearby to switch off the power if necessary.

- Use only one hand when working with powered-on electrical equipment. This is to avoid making a complete circuit, which will cause electrical shock. Use extreme caution when using metal tools, which can easily damage any electrical components or circuit boards they come into contact with.

- Do not use mats designed to decrease static electrical discharge as protection from electrical shock. Instead, use rubber mats that have been specifically designed as electrical insulators.

- The power supply power cords must include a grounding plug and must be plugged into grounded electrical outlets.

- Serverboard Battery: **CAUTION** - There is a danger of explosion if the onboard battery is installed upside down, which will reverse its polarites (see Figure 4-1). This battery must be replaced only with the same or an equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

- CD-ROM Laser: **CAUTION** - this server may have come equipped with a CD-ROM drive. To prevent direct exposure to the laser beam and hazardous radiation exposure, do not open the enclosure or use the unit in any unconventional way.

- Mainboard replaceable soldered-in fuses: Self-resetting PTC (Positive Temperature Coefficient) fuses on the mainboard must be replaced by trained service technicians only. The new fuse must be the same or equivalent as the one replaced. Contact technical support for details and support.

4-2 General Safety Precautions

Follow these rules to ensure general safety:

- Keep the area around the 5025B-4/5025B-T clean and free of clutter.

- The 5025B-4/5025B-T weighs approximately 50 lbs. when fully loaded. When lifting the system, two people at either end should lift slowly with their feet spread out to distribute the weight. Always keep your back straight and lift with your legs.

- Place the chassis top cover and any system components that have been removed away from the system or on a table so that they won't accidentally be stepped on.

- While working on the system, do not wear loose clothing such as neckties and unbuttoned shirt sleeves, which can come into contact with electrical circuits or be pulled into a cooling fan.

- Remove any jewelry or metal objects from your body, which are excellent metal conductors that can create short circuits and harm you if they come into contact with printed circuit boards or areas where power is present.

- After accessing the inside of the system, close the system back up and secure it to the rack unit with the retention screws after ensuring that all connections have been made.

4-3 ESD Precautions

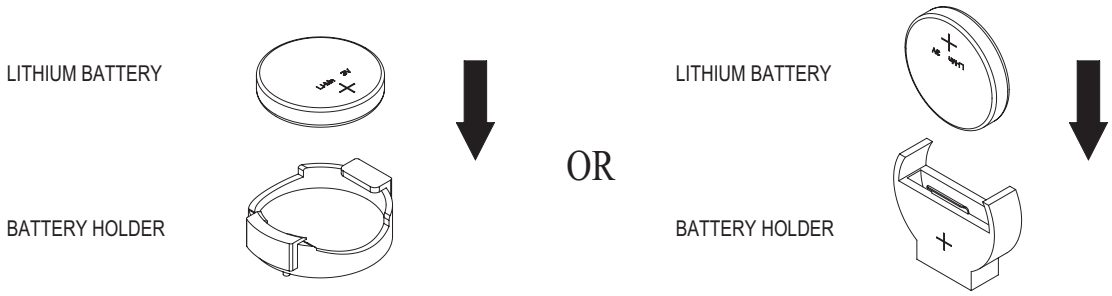
Electrostatic discharge (ESD) is generated by two objects with different electrical charges coming into contact with each other. An electrical discharge is created to neutralize this difference, which can damage electronic components and printed circuit boards. The following measures are generally sufficient to neutralize this difference before contact is made to protect your equipment from ESD:

- Use a grounded wrist strap designed to prevent static discharge.
- Keep all components and printed circuit boards (PCBs) in their antistatic bags until ready for use.
- Touch a grounded metal object before removing the board from the antistatic bag.
- Do not let components or PCBs come into contact with your clothing, which may retain a charge even if you are wearing a wrist strap.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

4-4 Operating Precautions

Care must be taken to assure that the chassis cover is in place when the 5025B-4/5025B-T is operating to assure proper cooling. Out of warranty damage to the system can occur if this practice is not strictly followed.

Figure 4-1. Installing the Onboard Battery



Chapter 5

Advanced Serverboard Setup

This chapter covers the steps required to install the X7SB4/X7SBE serverboard into the chassis, connect the data and power cables and install add-on cards. All serverboard jumpers and connections are also described. A layout and quick reference chart are included in this chapter for your reference. Remember to completely close the chassis when you have finished working with the serverboard to better cool and protect the system.

5-1 Handling the Serverboard

Electrostatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully (see previous chapter). To prevent the serverboard from bending, keep one hand under the center of the board to support it when handling. The following measures are generally sufficient to protect your equipment from electric static discharge.

Precautions

- Use a grounded wrist strap designed to prevent Electrostatic Discharge (ESD).
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the serverboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the serverboard.

Unpacking

The serverboard is shipped in antistatic packaging to avoid electrical static discharge. When unpacking the board, make sure the person handling it is static protected.

5-2 Serverboard Installation

This section explains the first step of physically mounting the X7SB4/X7SBE into the SC822S-400LP/SC822TQ-400LP chassis. Following the steps in the order given will eliminate the most common problems encountered in such an installation. To remove the serverboard, follow the procedure in reverse order.

Installing to the Chassis

1. Access the inside of the system by removing the screws from the back lip of the top cover of the chassis, then pull the cover off.

2. The X7SB4/X7SBE requires a chassis big enough to support a 12" x 9.6" serverboard, such as Supermicro's SC822S-400LP/SC822TQ-400LP.

3. Make sure that the I/O ports on the serverboard align properly with their respective holes in the I/O shield at the back of the chassis.

4. Carefully mount the serverboard to the serverboard tray by aligning the board holes with the raised metal standoffs that are visible in the chassis.

5. Insert screws into all the mounting holes on your serverboard that line up with the standoffs and tighten until snug (if you screw them in too tight, you might strip the threads). Metal screws provide an electrical contact to the serverboard ground to provide a continuous ground for the system.

6. Finish by replacing the top cover of the chassis.

5-3 Connecting Cables

Now that the serverboard is installed, the next step is to connect the cables to the board. These include the data cables for the peripherals and control panel and the power cables.

Connecting Data Cables

The cables used to transfer data from the peripheral devices have been carefully routed to prevent them from blocking the flow of cooling air that moves through the system from front to back. If you need to disconnect any of these cables, you should take care to keep them routed as they were originally after reconnecting them (make sure the red wires connect to the pin 1 locations). The following data cables (with their locations noted) should be connected. (See the layout on page 5-11 for connector locations.)

- Control Panel cable (JF1)
- Floppy drive cable (Floppy)
- 5025B-4: SCSI drive data cable (JA1)
- 5025B-T: SATA drive data cables (I-SATA0 ~ I-SATA3)

Important! Make sure the the cables do not come into contact with the fans.

Connecting Power Cables

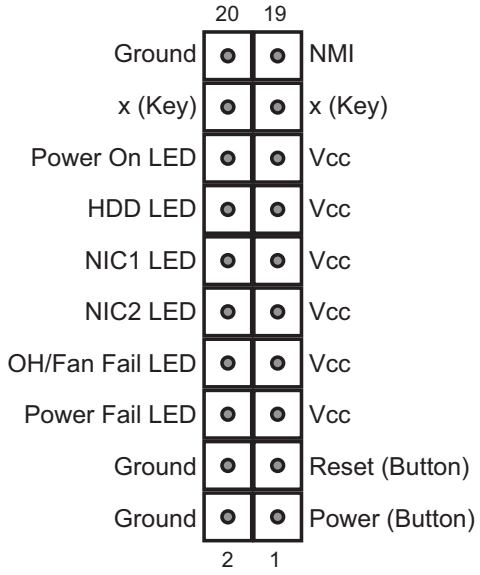
The X7SB4/X7SBE has a 24-pin primary power supply connector (JPW1) for connection to the ATX power supply. In addition, there is an 8-pin processor power connector (JPW2) that must be connected to your power supply. See Section 5-9 for power connector pin definitions.

Connecting the Control Panel

JF1 contains header pins for various front control panel connectors. See Figure 5-1 for the pin locations of the various front control panel buttons and LED indicators.

All JF1 wires have been bundled into a single cable to simplify this connection. Make sure the red wire plugs into pin 1 as marked on the board. The other end connects to the Control Panel PCB board, located just behind the system status LEDs on the chassis. See Chapter 5 for details and pin descriptions.

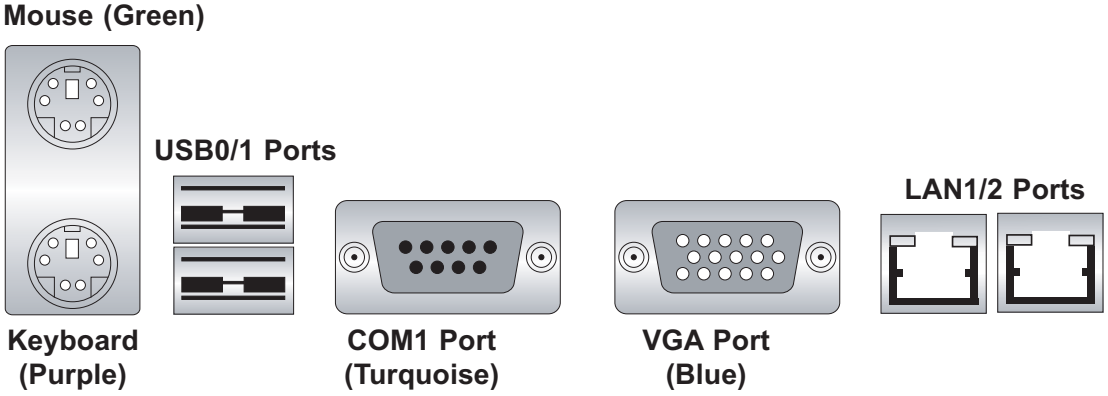
Figure 5-1. Control Panel Header Pins



5-4 I/O Ports

The I/O ports are color coded in conformance with the PC 99 specification. See Figure 5-2 below for the colors and locations of the various I/O ports.

Figure 5-2. I/O Ports



5-5 Installing the Processors and Heat Sink

Avoid placing direct pressure to the top of the processor package. Always remove the power cord first before adding, removing or changing any hardware components.

Notes: Always connect the power cord last and remove it before adding, removing or changing any components. Make sure to install the processor into the CPU socket before you install the CPU heat sink.

Intel's boxed Xeon CPU package contains the CPU fan and heat sink assembly. If you buy the CPUs separately, use only Intel-certified heat sinks and fans.

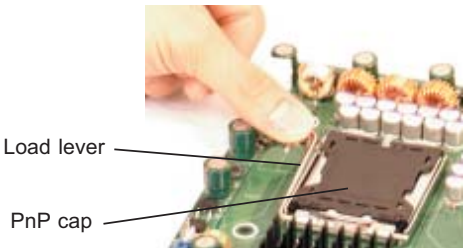
Make sure to install the heat sink backplate and the serverboard into the chassis before you install the CPU heat sink and fan (see below).

Inspect the Xeon 3200/3000 CPU socket and make sure that the CPU plastic cap is in place and none of the socket pins are bent. Otherwise, contact the retailer immediately.

All graphics shown in this manual are for reference only. The components that came with your serverboard may or may not look exactly the same as the pictures shown in this manual.

CPU Installation

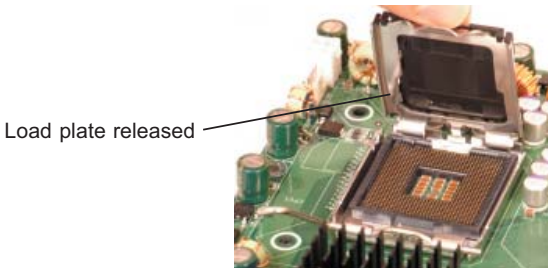
1. A black PnP cap is attached to the load plate to protect the CPU socket. Press the load lever down and away from the retention clasp to release the load plate from its locked position.



2. Gently lift the load lever to open the load plate.

3. Use your thumb and your index finger to hold the CPU at opposite sides.

4. Align pin1 of the CPU (the corner marked with a triangle) with the notched corner of the CPU socket.



5. Find the corner of the CPU that has a semi-circle cutout below a gold dot (CPU key). This corner should be aligned with the cutout on the socket (socket key).

6. Once aligned, carefully lower the CPU straight down into the socket. Do not drop the CPU on the socket, do not move the CPU horizontally or vertically and do not rub the CPU against any surface or any of the contacts, which may damage the CPU and/or contacts.

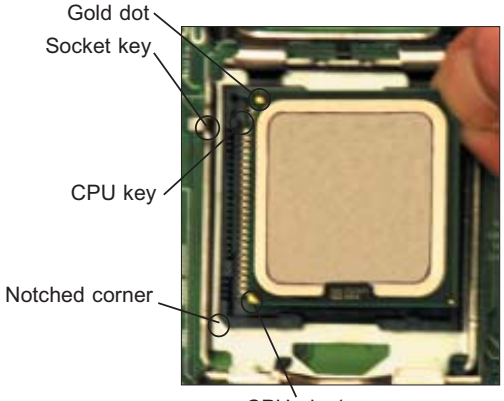
Warning! Make sure you lift the lever completely when installing the CPU; otherwise, damage to the socket or CPU may occur.

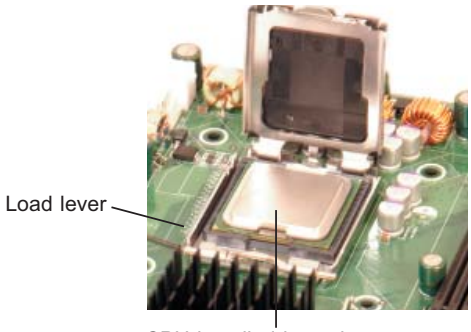
7. With the CPU in the socket, inspect the four corners of the CPU to make sure that it is properly installed.

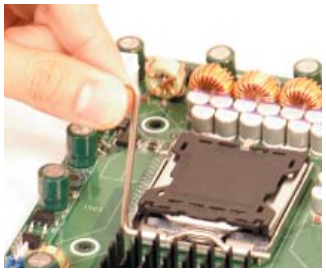
8. Use your thumb to gently push the load lever down until it snaps into the retention clasp.

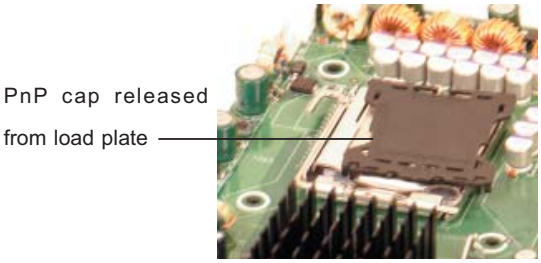
9. If the CPU is properly installed into the socket, the PnP cap will be automatically released from the load plate when the lever locks. Remove the cap. Repeat steps to install a second CPU if desired.

Warning! Keep the plastic PnP cap. The serverboard must be shipped with the PnP cap properly installed to protect the CPU socket. Shipment without the PnP cap properly installed will void the warranty.









Heat Sink Installation

1. Locate the "CPU FAN1" header on the motherboard.

2. Position the heat sink in such a way that the heat sink fan wires are closely routed to the CPU fan and do not interfere with other components.

3. Inspect the CPU fan wires to make sure that the wires are routed through the bottom of the heat sink.

4. Remove the thin layer of the protective film from the copper core of the heat sink. **Warning:** the CPU may overheat if the protective film is not removed from the heat sink.

5. Apply the proper amount of thermal grease on the CPU. (If your heat sink came with a thermal pad, please ignore this step.)

6. If necessary, rearrange the wires so that they are not pinched between the heat sink and the CPU. Also make sure there is clearance between the fan wires and the fins of the heat sink.

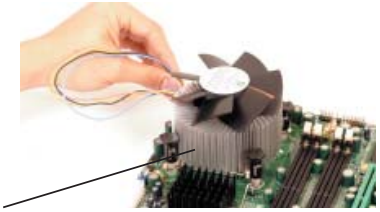
7. Align the four heat sink fasteners with the mounting holes on the motherboard. Gently push diagonal pairs of fasteners (#1 & #2 and #3 & #4) into the mounting holes until you hear a click. Orient each fastener so that the narrow end of the groove points outward.

Note: not all steps are pictured.

Step 5

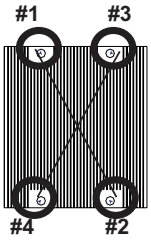
Thermal Grease

Step 6



Heat sink fins

Step 7



Narrow end of the groove points outward

5-6 Installing Memory

CAUTION! Exercise extreme care when installing or removing DIMM modules to prevent any possible damage.

Memory Support

The X7SB4/X7SBE supports dual or single channel, ECC/Non-ECC unbuffered DDR2-800/667 SDRAM. Both interleaved and non-interleaved memory are supported, so you may populate any number of DIMM slots. (Populating DIMM#1A/DIMM#2A and/or DIMM#1B/DIMM#2B with memory modules of the same size and type will result in two-way interleaved memory, which is faster than the single channel, non-interleaved memory.) Note that when ECC memory is used, it may take 25-40 seconds for the VGA to display.)

Installing Memory Modules

1. Insert each DDR2 memory module vertically into its slot, starting with DIMM #1A. Pay attention to the notch along the bottom of the module to prevent inserting the module incorrectly.

2. Gently press down on the DIMM module until it snaps into place in the slot. Repeat for all modules. (See support information below.)

3. To enhance memory performance, install pairs of memory modules of the same type and of the same, beginning with DIMM #1A and DIMM #2A, then DIMM #1B and DIMM #2B.

Notes

Due to a chipset limitation, 8GB of memory can only be supported by the following operating systems:

- 32-Bit: Windows 2000 Advanced Server, Windows Server 2003 Enterprise Edition;

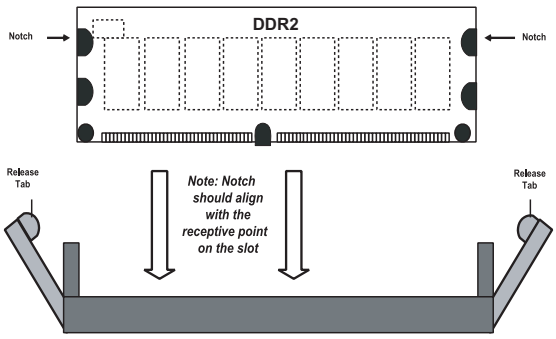
- 64-Bit: Windows Server 2003 Standard x64 Edition, Windows XP Professional x64 Edition, Windows Server 2003 Enterprise x64 Edition

Some old-versions of DDR2-667 may not match Intel's On-Die Temperature requirement and will automatically be downgraded to run at 533 MHz. If this occurs, contact your memory vendor to check the ODT value.

Due to memory allocation to system devices, memory remaining available for operational use will be reduced when 4 GB of RAM is used. The reduction in memory availability is disproportional. (Refer to the Memory Availability Table below for details.)

Possible System Memory Allocation & Availability		
System Device	Size	Physical Memory Remaining (4 GB Total System Memory)
Firmware Hub flash memory (System BIOS)	1 MB	3.99
Local APIC	4 KB	3.99
Area Reserved for the chipset	2 MB	3.99
I/O APIC (4 Kbytes)	4 KB	3.99
PCI Enumeration Area 1	256 MB	3.76
PCI Express (256 MB)	256 MB	3.51
PCI Enumeration Area 2 (if needed) -Aligned on 256-MB boundary-	512 MB	3.01
VGA Memory	16 MB	2.85
TSEG	1 MB	2.84
Memory available to System BIOS & OS applications		2.84

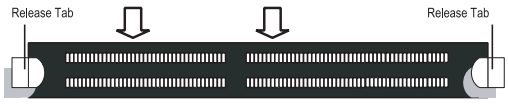
Figure 5-3. DIMM Installation



To Install: Insert module vertically and press down until it snaps into place. Pay attention to the bottom notches.

To Remove: Use your thumbs to gently push each release tab outward to free the DIMM from the slot.

Top View of DDR2 Slot



5-7 Adding PCI Add-On Cards

The SC822S-400LP/SC822TQ-400LP chassis can accommodate all PCI expansion slots on the X7SB4/X7SBE being populated with low-profile cards.

Installing an Add-on Card

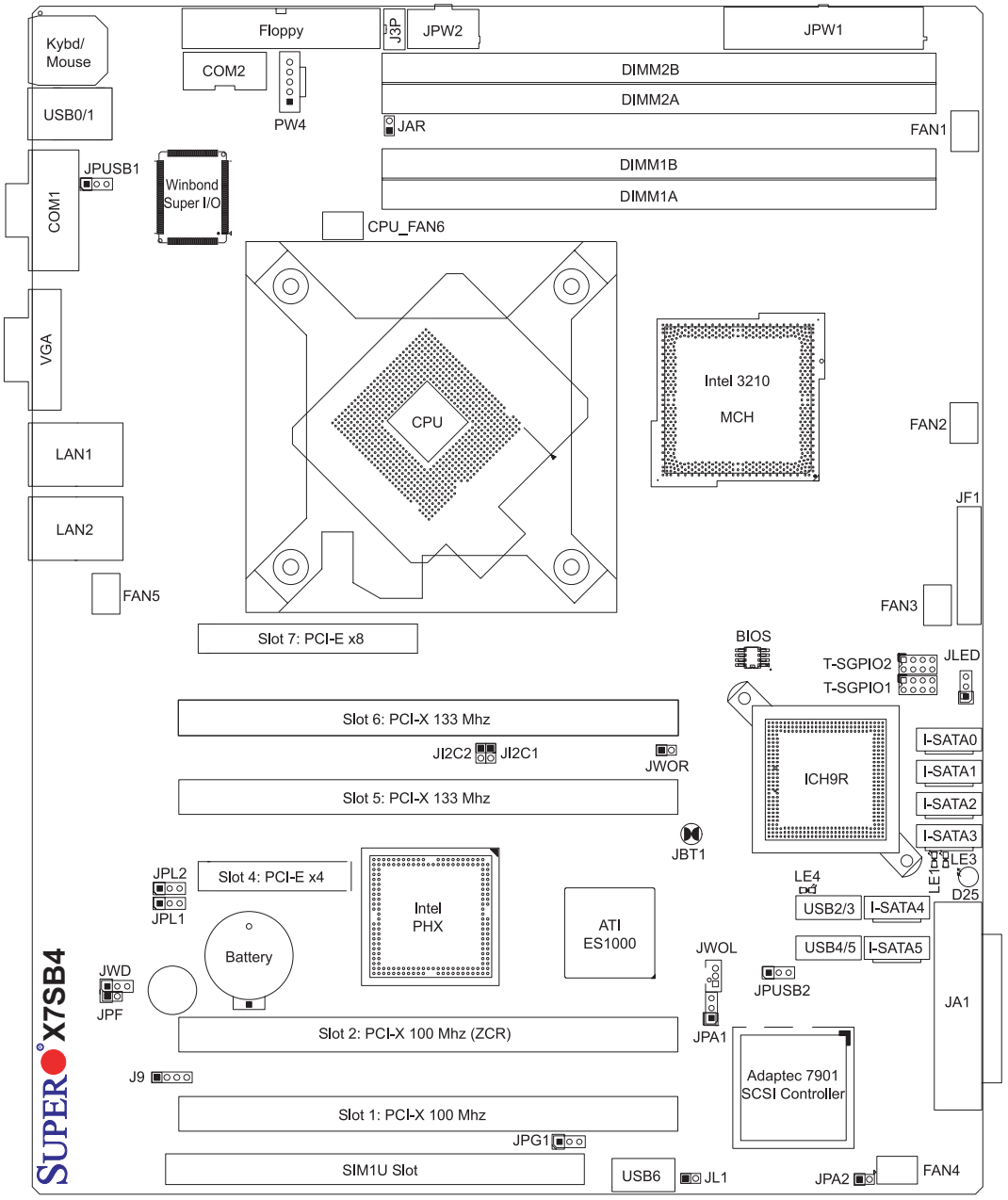
1. Begin by removing the shield for the PCI slot you wish to populate.

2. Fully seat the card into the slot, pushing down with your thumbs evenly on both sides of the card.

3. Finish by using a screw to secure the top of the card shield to the chassis. The PCI slot shields protect the serverboard and its components from EMI and aid in proper ventilation, so make sure there is always a shield covering each unused slot.

5-8 Serverboard Details

Figure 5-4. X7SB4/X7SBE Layout
(not drawn to scale)



Notes

Jumpers not indicated are for testing purposes only.

When illuminated, LE1 indicates the Standby Power is on. Make sure to remove the power cable before installing or removing components.

SCSI and the PCI-X 100MHz ZCR slot are available for the X7SB4 only (slot 4 is a regular PCI-100 MHz slot for the X7SBE and a PCI-100 MHz ZCR slot for the X7SB4).

X7SB4/X7SBE Quick Reference

Jumper	Description	Default Setting
JBT1	CMOS Clear	(See Section 5-10)
JI²C1/JI²C2	SMB to PCI Slots	Open (Disabled)
JPA1*	SCSI Controller Enable/Disable	Pins 1-2 (Enabled)
JPA2*	SCSI Channel Termination	Open (Enabled)
JPF	Power Force On Enable/Disable	Open (Disabled)
JPG1	VGA Enable/Disable	Pins 1-2 (Enabled)
JPL1/JPL2	LAN1/2 Enable/Disable	Pins 1-2 (Enabled)
JPUSB1	Backpanel USB Wake-Up	Pins 1-2 (Enabled)
JPUSB2	Front Access USB Wake-Up	Pins 2-3 (Disabled)
JWD	Watch Dog	Pins 1-2 (Reset)

Connector	Description
COM1/COM2	COM1/COM2 Serial Port/Header
FAN 1-6	Chassis/CPU Fan Headers
Floppy	Floppy Disk Drive Connector
I-SATA0 ~ I-SATA5	SATA Ports
J3P	Power Supply Fail Header
J9	Speaker Header
JA1*	SCSI Connector
JAR	Alarm Rest Header
JF1	Front Panel Connector
JL1	Chassis Intrusion Header
JOH1	Overheat Warning Header
JPW1	24-pin Main ATX Power Connector
JPW2	+12V 8-pin Secondary Power Connector
JWOL/JWOR	Wake-On-LAN Header/Wake-On-Ring Header
LAN1/2	Gigabit Ethernet (RJ45) Ports
PW4	System Management Bus Header
SMBUS	SMBus Connector
T-SGPIO-1/T-SGPIO-2	Serial General Purpose Input/Output Headers
USB0/1	Universal Serial Bus (USB) Ports
USB2/3, USB4/5	Universal Serial Bus (USB) Headers

*X7SB4 only.

5-9 Connector Definitions

Main ATX Power Supply Connector

The primary power supply connector (JPW1) meets the SSI (Superset ATX) 24-pin specification. Refer to the table on the right for the pin definitions of the ATX 24-pin power connector. You must also connect the 8-pin (JPW2/ JPW3) processor power connectors to your power supply (see below).

ATX Power 24-pin Connector Pin Definitions (JPW1)

Pin#	Definition	Pin #	Definition
13	+3.3V	1	+3.3V
14	-12V	2	+3.3V
15	COM	3	COM
16	PS_ON	4	+5V
17	COM	5	COM
18	COM	6	+5V
19	COM	7	COM
20	Res (NC)	8	PWR_OK
21	+5V	9	5VSB
22	+5V	10	+12V
23	+5V	11	+12V
24	COM	12	+3.3V

Secondary Power Connector

JPW2 must also be connected to the power supply. See the table on the right for pin definitions.

+12V 4-pin Power Pin Definitions (JPW2)

Pins	Definition
1 - 2	Ground
3 - 4	+12V

Required Connection

PW_ON Connector

The PW_ON connector is on pins 1 and 2 of JF1. This header should be connected to the chassis power button. See the table on the right for pin definitions.

Power Button Pin Definitions (JF1)

Pin#	Definition
1	PW_ON
2	Ground

Reset Connector

The reset connector is located on pins 3 and 4 of JF1 and attaches to the reset switch on the computer chassis. See the table on the right for pin definitions.

Reset Button Pin Definitions (JF1)

Pin#	Definition
3	Reset
4	Ground

Power Fail LED

The Power Fail LED connection is located on pins 5 and 6 of JF1. Refer to the table on the right for pin definitions.

PWR Fail LED Pin Definitions (JF1)

Pin#	Definition
5	Vcc
6	Ground

Overheat/Fan Fail LED (OH)

Connect an LED to the OH connection on pins 7 and 8 of JF1 to provide advanced warning of chassis overheating. Refer to the table on the right for pin definitions.

OH/Fan Fail LED Pin Definitions (JF1)	
Pin#	Definition
7	Vcc
8	Ground

OH/Fan Fail Indicator Status	
State	Definition
Off	Normal
On	Overheat
Flash-ing	Fan Fail

NIC2 (JLAN2) LED

The LED connections for JLAN2 are on pins 9 and 10 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC2 LED Pin Definitions (JF1)	
Pin#	Definition
9	Vcc
10	Ground

NIC1 (JLAN1) LED

The LED connections for JLAN1 are on pins 11 and 12 of JF1. Attach an LED cable to display network activity. See the table on the right for pin definitions.

NIC1 LED Pin Definitions (JF1)	
Pin#	Definition
11	Vcc
12	Ground

HDD LED

The HDD LED connection is located on pins 13 and 14 of JF1. This LED is used to display all IDE and SATA activity. See the table on the right for pin definitions.

HDD LED Pin Definitions (JF1)	
Pin#	Definition
13	Vcc
14	HD Active

Power On LED

The Power On LED connector is located on pins 15 and 16 of JF1 (use JLED for a 3-pin connector). This connection is used to provide LED indication of power being supplied to the system. See the table on the right for pin definitions.

Power LED Pin Definitions (JF1)	
Pin#	Definition
15	5V Stby
16	Control

NMI Button

The non-maskable interrupt button header is located on pins 19 and 20 of JF1. Refer to the table on the right for pin definitions.

NMI Button Pin Definitions (JF1)	
Pin#	Definition
19	Control
20	Ground

Fan Headers

There are six fan headers on the serverboard, all of which are 4-pin fans. However, pins 1-3 of the fan headers are backward compatible with the traditional 3-pin fans. See the table on the right for pin definitions. The onboard fan speeds are controlled by Thermal Management (via Hardware Monitoring) under the Advanced Section in the BIOS. The default is disabled. When using Thermal Management setting, please use all 3-pin fans or all 4-pin fans.

Fan Header Pin Definitions (FAN1-8)	
Pin#	Definition
1	Ground (Black)
2	+12V (Red)
3	Tachometer
4	PWM Control

Note: Fan 6 is for the CPU heat sink.

ATX PS/2 Keyboard and PS/2 Mouse Ports

The ATX PS/2 keyboard and the PS/2 mouse are located beside the USB0/1 ports. The mouse port is above the keyboard port. See the table on the right for pin definitions.

PS/2 Keyboard and Mouse Port Pin Definitions (J28)	
Pin#	Definition
1	Data
2	NC
3	Ground
4	VCC
5	Clock
6	NC

Serial Ports

Two serial ports are included on the serverboard. COM1 is a backpanel port and COM2 is a header located behind the mouse/keyboard ports. See the table on the right for pin definitions.

Serial Port Pin Definitions (COM1/COM2)			
Pin #	Definition	Pin #	Definition
1	DCD	6	DSR
2	RXD	7	RTS
3	TXD	8	CTS
4	DTR	9	RI
5	Ground	10	NC

Chassis Intrusion

The Chassis Intrusion header is designated JL1. Attach an appropriate cable from the chassis to inform you of a chassis intrusion when the chassis is opened

Chassis Intrusion Pin Definitions (JL1)	
Pin#	Definition
1	Intrusion Input
2	Ground

Wake-On-LAN

The Wake-On-LAN header is designated JWOL on the serverboard. See the table on the right for pin definitions. You must also have a LAN card with a Wake-On-LAN connector and cable to use this feature.

Wake-On-LAN Pin Definitions (JWOL)	
Pin#	Definition
1	+5V Standby
2	Ground
3	Wake-up

Wake-On-Ring

The Wake-On-Ring header is designated JWOR. This function allows your computer to receive and be "awakened" by an incoming call when in the suspend state. See the table on the right for pin definitions. You must also have a WOR card and cable to use this feature.

Wake-On-Ring Pin Definitions (JWOR)	
Pin#	Definition
1	Ground (Black)
2	Wake-up

Power Supply Fail

Connect a cable from your power supply to J3P to provide warning of power supply failure. This warning signal is passed through the PWR_LED pin to indicate of a power failure on the chassis. See the table on the right for pin definitions.

PWR Supply Fail LED Pin Definitions (J3P)	
Pin#	Definition
1	PWR 1: Fail
2	PWR 2: Fail
3	PWR 3: Fail
4	Signal: Alarm Reset

Note: This feature is only available when using Supermicro redundant power supplies.

LAN1/2 (Ethernet Ports)

Two Ethernet ports (designated LAN1 and LAN2) are located beside the VGA port on the I/O backplane. These ports accept RJ45 type cables.

External Speaker/Internal Buzzer

On the J9 header, pins 1-4 are for an external speaker and pins 3-4 are for the internal speaker. If you wish to use an external speaker, connect it to pins 1-4 to. If you wish to use the onboard speaker, you should close pins 3-4 with a jumper.

Speaker Connector (J9)

Pin Setting	Definition
Pins 3-4	Internal Speaker
Pins 1-4	External Speaker

Universal Serial Bus (USB)

There are two Universal Serial Bus ports located on the I/O panel and four additional USB headers located on the serverboard. The headers can be used to provide front side USB access (cables not included). See the table on the right for pin definitions.

Universal Serial Bus Pin Definitions (USB)

USB0/1		USB2/3/4/5	
Pin #	Definition	Pin #	Definition
1	+5V	1	+5V
2	PO-	2	PO-
3	PO+	3	PO+
4	Ground	4	Ground
5	N/A	5	Key

SGPIO Headers

The SGPIO (Serial General Purpose Input/Output) headers are used to communicate with a system-monitoring chip on the backplane. See the table on the right for pin definitions.

SGPIO Header Pin Definitions (T-SGPIO-1/T-SGPIO-2)

Pin#	Definition	Pin	Definition
1	*NC	2	*NC
3	Ground	4	DATA Out
5	Load	6	Ground
7	Clock	8	*NC

NC = No Connection

Alarm Reset

If three power supplies are installed, the system can notify you when any of the three power modules fail. Connect JAR to a micro-switch to enable you to turn off the alarm that is activated when a power module fails. See the table on the right for pin definitions.

Alarm Reset Header Pin Definitions (JAR)

Pin Setting	Definition
Pin 1	Ground
Pin 2	+5V

SMBUS Connector

The SMBus (I^2C) connector can be used to monitor the status of the power supply, fan and system temperature. See the table on the right for pin definitions.

SMBUS Connector Pin Definitions (SMBUS)

Pin#	Definition
1	Clock
2	Data
3	PWR Fail (Input from PS to MB)
4	Ground
5	+3.3V

Power SMBUS Header

A Power SMB header is located at PW4. Connect the appropriate cable here to utilize SMB on your system. See the table on the right for pin definitions.

Power SMB Header Pin Definitions (PW4)

Pin#	Definition
1	Clock
2	Data
3	PWR Fail
4	Ground
5	+3.3V

Overheat LED/Fan Fail (JOH1)

The JOH1 header is used to connect an LED to provide warning of chassis overheating. This LED will blink to indicate a fan failure. Refer to the table on right for pin definitions.

OH/Fan Fail LED States

State	Message
Solid	Overheat
Blinking	Fan Fail

Overheat LED Pin Definitions (JOH1)

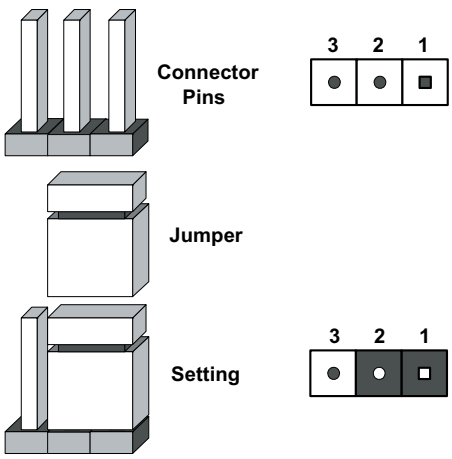
Pin#	Definition
1	5vDC
2	OH Active

5-10 Jumper Settings

Explanation of Jumpers

To modify the operation of the serverboard, jumpers can be used to choose between optional settings. Jumpers create shorts between two pins to change the function of the connector. Pin 1 is identified with a square solder pad on the printed circuit board. See the serverboard layout pages for jumper locations.

Note: On a two-pin jumper, "Closed" means the jumper is on both pins and "Open" means the jumper is either on only one pin or completely removed.



CMOS Clear

JBT1 is used to clear CMOS (which will also clear any passwords). Instead of pins, this jumper consists of contact pads to prevent accidentally clearing the contents of CMOS.

To clear CMOS,

1. First power down the system and unplug the power cord(s).
2. With the power disconnected, short the CMOS pads with a metal object such as a small screwdriver.
3. Remove the screwdriver (or shorting device).
4. Reconnect the power cord(s) and power on the system.

Note: *Do not use the PW_ON connector to clear CMOS*.

VGA Enable/Disable

JPG1 allows you to enable or disable the VGA port. The default position is on pins 1 and 2 to enable VGA. See the table on the right for jumper settings.

VGA Enable/Disable Jumper Settings (JPG1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

LAN1/2 Enable/Disable

Change the setting of jumper JPL1 and JPL2 to enable or disable the LAN1 and LAN2 Ethernets ports, respectively. See the table on the right for jumper settings. The default setting is enabled.

LAN1/2 Enable/Disable Jumper Settings (JPL1)	
Jumper Setting	Definition
Pins 1-2	Enabled
Pins 2-3	Disabled

3rd Power Fail Detect

The system can notify you in the event of a power supply failure. This feature is available when three power supply units are installed in the chassis with one acting as a backup. If you only have one or two power supply units installed, you should disable this detection feature (the default setting) with J3P to prevent false alarms.

3rd Power Fail Detect Jumper Settings (J3P)	
Jumper Setting	Definition
Closed	Enabled
Open	Disabled

SMBus to PCI-X/PCI-Exp. Slots

Jumpers JI^2C1 and JI^2C2 allow you to connect the System Management Bus (I^2C) to the PCI-X/PCI-E slots. The default setting is Open (Disabled.) Both jumpers must be set to the same setting See the table on the right for jumper settings.

SMBus to PCI-X/PCI-E Slots Jumper Settings (JI^2C1/JI^2C2)		
Jumper Setting	Definition	
JI^2C1: Closed	JI^2C2:Closed	Enabled
JI^2C1: Open	JI^2C2: Open	Disabled

Watch Dog Enable/Disable

JWD controls the Watch Dog function. Watch Dog is a system monitor that can reboot the system when a software application hangs. Jumping pins 1-2 will cause WD to reset the system if an application hangs. Jumping pins 2-3 will generate a non-maskable interrupt signal for the application that hangs. See the table on the right for jumper settings. Watch Dog must also be enabled in BIOS.

Note: When enabled, the user needs to write their own application software in order to disable the Watch Dog Timer.

Watch Dog Jumper Settings (JWD)

Jumper Setting	Definition
Pins 1-2	Reset
Pins 2-3	NMI
Open	Disabled

SCSI Enable/Disable (X7SB4 only)

Jumper JPA1 allows you to enable or disable the SCSI controller. The default setting is to close pins 1-2 to enable the SCSI connection. See the table on the right for jumper settings.

SCSI Controller Enable/Disable Jumper Settings (JPA1)

Pin#	Definition
Pins 1-2	Enabled (*default)
Pins 2-3	Disabled

SCSI Termination Enable/Disable (X7SB4 Only)

Jumper JPA2 allows you to enable or disable the termination of the SCSI connector. The default setting is open to enable (terminate) the SCSI channel. (For SCSI to function properly, please do not change the default setting.) See the table on the right for jumper settings.

SCSI Termination Enable/Disable Jumper Settings (JPA2)

Pin#	Definition
Open	Enabled (*default)
Closed	Disabled

Default: Open: Do not change the default setting!

Force-Power-On Enable

Jumper JPF allows you to enable or disable the Force-Power-On function. If enabled, power will always stay on automatically. If this function is disabled, the user needs to press the power button to power on the system.

Power Force On Jumper Settings

Pin#	Definition
Open	Normal
Closed	Force On

5-11 Onboard Indicators

LAN1/2 LEDs

The Ethernet ports (located beside the VGA port) have two LEDs. On each port, one LED indicates activity while the other LED may be green, amber or off to indicate the speed of the connection. See the table on the right for the functions associated with the connection speed LED.

GLAN1/2 LED (Connection Speed Indicator)	
LED Color	Definition
Off	10 MHz
Green	100 MHz
Amber	1 GHz

Onboard Power LED (LE1)

An Onboard Power LED is located at LE1. This LED Indicator is lit when the system is on. Be sure to unplug the power cable before removing or adding any components. See the table on the right for more details.

Onboard Power LED Indicator (LE1)	
LED Color	Definition
Off	System Off
Green	System on

POST LEDs

Two POST (Power-On Self Test) LEDs are located at LE3 and LE4. The green LED is LE3 and the yellow LED is LE4. These LEDs indicate POST activity during system bootup. Refer to the table on the right for details.

POST LED Indicators (LE3/LE4)		
	LE3 (green)	LE4 (yellow)
POST	On	On
Memory Init.	Blinking	Blinking
PCI Initialization	On	Blinking
Video Init.	Blinking	On
POST Completed	Off	Off

System Status LED

A System Status LED is located at D25. When the green light is on, the system is operating normally. When the orange light is on, the system is in a standby mode, but the AC power cable is still connected. When is red light is on, it indicates a power error. Refer to the table on the right for details.

System Status LED Indicator (D25)	
LED Color	Definition
Green	System: Normal
Orange	System: Standby, power cable is connected
Red	Possible power error

5-12 Floppy, IPMI, SCSI and SATA Ports

Floppy Drive Connector

The floppy connector is located behind the mouse/keyboard ports. See the table at right for pin definitions.

Floppy Drive Connector Pin Definitions (Floppy)

Pin#	Definition	Pin #	Definition
1	Ground	2	FDHDIN
3	Ground	4	Reserved
5	Key	6	FDEDIN
7	Ground	8	Index
9	Ground	10	Motor Enable
11	Ground	12	Drive Select B
13	Ground	14	Drive Select B
15	Ground	16	Motor Enable
17	Ground	18	DIR
19	Ground	20	STEP
21	Ground	22	Write Data
23	Ground	24	Write Gate
25	Ground	26	Track 00
27	Ground	28	Write Protect
29	Ground	30	Read Data
31	Ground	32	Side 1 Select
33	Ground	34	Diskette

SATA Ports

There are no jumpers to configure the onboard SATA ports. See the table on the right for pin definitions.

SATA Port Pin Definitions (I-SATA0~I-SATA5)

Pin #	Definition
1	Ground
2	TXP
3	TXN
4	Ground
5	RXN
6	RXP
7	Ground

SIM 1U IPMI

A SIM 1U IPMI slot is located near PCI-X slot #1. This connection provides an IPMI (Intelligent Power Management Interface) connection for the motherboard.

Ultra 320 SCSI Connector (X7SB4 only)

An Ultra 320 SCSI connector is located at JA1. Refer to the table at right for the pin definitions.

Ultra320 SCSI Drive Connector Pin Definitions

Pin#	Definition	Pin #	Definition
1	+DB (12)	35	-DB (12)
2	+DB (13)	36	-DB (13)
3	+DB (14)	37	-DB (14)
4	+DB (15)	38	-DB (15)
5	+DB (P1)	39	-DB (P1)
6	+DB (0)	40	-DB (0)
7	+DB (1)	41	-DB (1)
8	+DB (2)	42	-DB (2)
9	+DB (3)	43	-DB (3)
10	+DB (4)	44	-DB (4)
11	+DB (5)	45	-DB (5)
12	+DB (6)	46	-DB (6)
13	+DB (7)	47	-DB (7)
14	+DB (P)	48	-DB (P)
15	Ground	49	Ground
16	DIFFSENS	50	Ground
17	TERMPWR	51	TERMPWR
18	TERMPWR	52	TERMPWR
19	Reserved	53	Reserved
20	Ground	54	Ground
21	+ATN	55	-ATN
22	Ground	56	Ground
23	+BSY	57	-BSY
24	+ACK	58	-ACK
25	+RST	59	-RST
26	+MSG	60	-MSG
27	+SEL	61	-SEL
28	+C/D	62	-C/D
29	+REQ	63	-REQ
30	+I/O	64	-I/O
31	+DB (8)	65	-DB (8)
32	+DB (9)	66	-DB (9)
33	+DB (10)	67	-DB (10)
34	+DB (11)	68	-DB (11)

Chapter 6

Advanced Chassis Setup

This chapter covers the steps required to install components and perform maintenance on the SC822S-400LP/SC822TQ-400LP chassis. For component installation, follow the steps in the order given to eliminate the most common problems encountered. If some steps are unnecessary, skip ahead to the step that follows.

Tools Required: The only tool you will need to install components and perform maintenance is a Philips screwdriver.

6-1 Static-Sensitive Devices

Electrocstatic discharge (ESD) can damage electronic components. To prevent damage to any printed circuit boards (PCBs), it is important to handle them very carefully. The following measures are generally sufficient to protect your equipment from ESD damage.

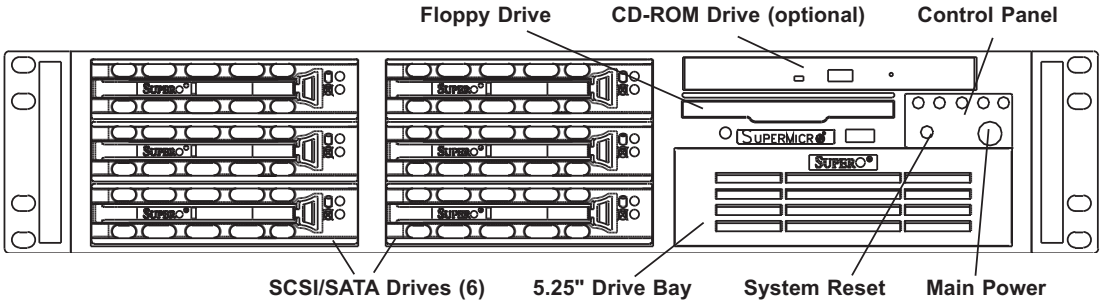
Precautions

- Use a grounded wrist strap designed to prevent static discharge.
- Touch a grounded metal object before removing any board from its antistatic bag.
- Handle a board by its edges only; do not touch its components, peripheral chips, memory modules or gold contacts.
- When handling chips or modules, avoid touching their pins.
- Put the motherboard, add-on cards and peripherals back into their antistatic bags when not in use.
- For grounding purposes, make sure your computer chassis provides excellent conductivity between the power supply, the case, the mounting fasteners and the motherboard.

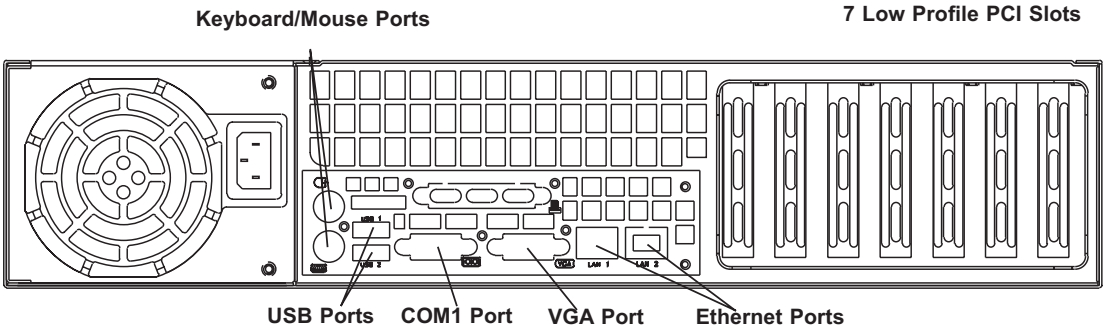
Unpacking

The motherboard is shipped in antistatic packaging to avoid static damage. When unpacking the board, make sure the person handling it is static protected.

Figure 6-1. Chassis: Front and Rear Views



Rear view



6-2 Control Panel

The control panel (located on the front of the chassis) must be connected to the JF1 connector on the motherboard to provide you with system status indications. A ribbon cable has bundled these wires together to simplify the connection. Connect the cable from JF1 on the motherboard to the Control Panel PCB (printed circuit board). Make sure the red wire plugs into pin 1 on both connectors. Pull all excess cabling out of the airflow path.

The LEDs inform you of system status. See "Chapter 3: System Interface" for details on the LEDs and the control panel buttons. Details on JF2 can be found in the "Chapter 5: Advanced Motherboard Installation."

6-3 System Fans

Three 8-cm fans provide all the cooling needed for the SuperServer 5025B-4/5025B-T. It is very important that the chassis top cover is properly installed and making a good seal for the cooling air to circulate properly through the chassis and cool the components. See Figure 6-2.

System Fan Failure

Fan speed is controlled by system temperature via a BIOS setting. If a fan fails, the remaining fan will ramp up to full speed and the overheat/fan fail LED on the control panel will turn on. Replace the failed fan at your earliest convenience with the same type and model (the system can continue to run with a failed fan). Remove the top chassis cover while the system is still running to determine which of the four fans has failed.

Replacing System Cooling Fans

Removing a Fan

1. Remove the chassis cover to locate the failed fan.

2. Press the tab on the top of the fan housing of the failed fan and remove the entire housing unit. The system power need not be shut down since the fans are all hot-pluggable.

Installing a New Fan

1. Replace the failed fan with an identical 8-cm, 12 volt fan (available from Supermicro).

2. Position the new fan at its proper place in the chassis by fitting the fan with its housing onto the fan mounts in the chassis.

3. A "click" can be heard if the fan (in its housing) is properly installed. If the system is already powered on, the fan will activate immediately upon being connected to its header on the motherboard.

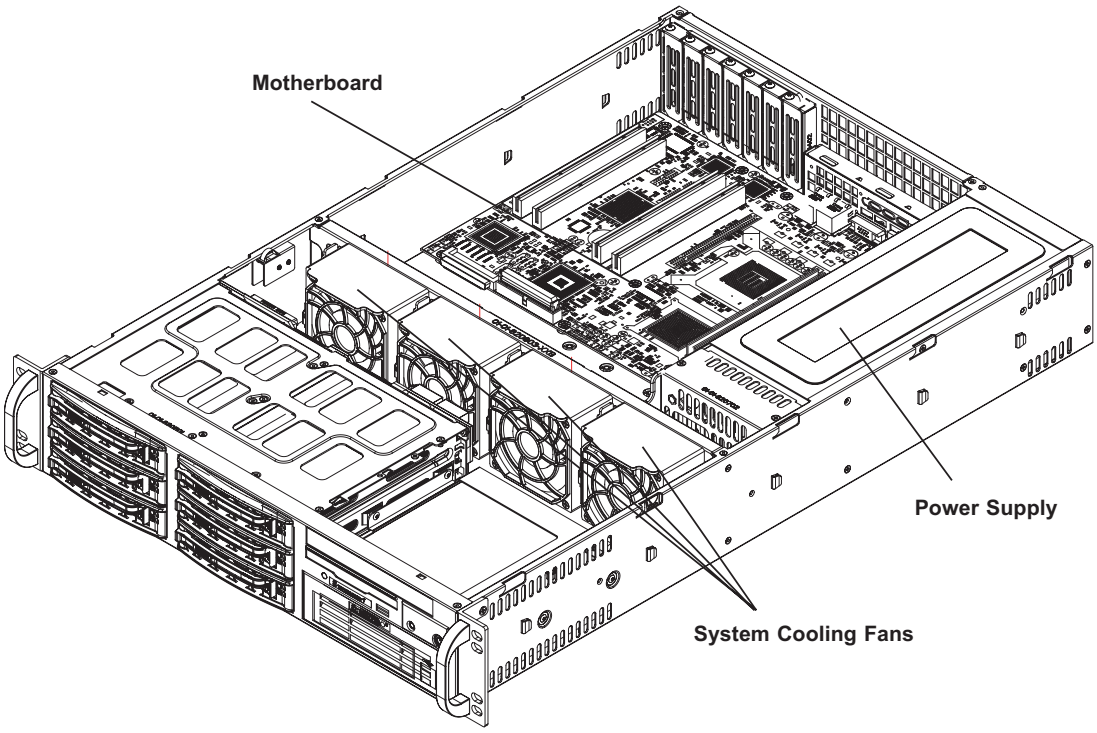


Figure 6-2. System Cooling Fans

6-4 Drive Bay Installation/Removal

Accessing the Drive Bays

SCSI Drives: You do not need to access the inside of the chassis to replace or swap SCSI drives. Proceed to the next step for instructions.

Note: You must use standard 1" high, 80-pin SCA SCSI drives in the SuperServer 5025B-4.

CD-ROM/Floppy Disk Drive: For installing/removing the CD-ROM or floppy disk drive, you will need to gain access to the inside of the server by removing the top cover of the chassis. Proceed to the "CD-ROM and Floppy Drive Installation" section later in this chapter for instructions.

5.25" Drive Bay: For installing/removing a component in the 5.25" drive bay, proceed to the "5.25" Drive Bay Installation" section later in this chapter for instructions.

SCSI/SATA Drive Installation

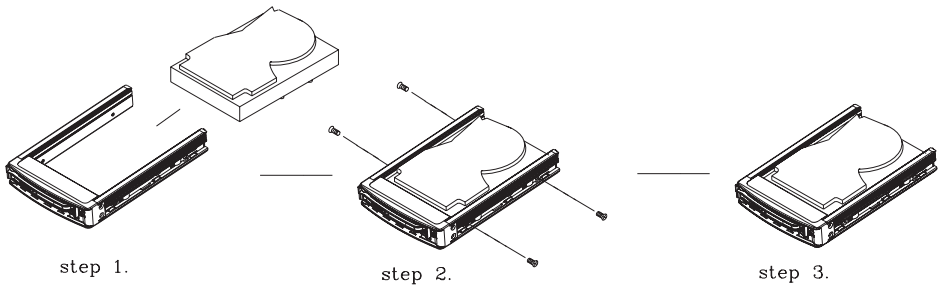
Mounting a SCSI/SATA Drive in a Drive Carrier

The SCSI/SATA drives are mounted in drive carriers to simplify their installation and removal from the chassis. Since these carriers also help promote proper airflow for the SCSI drive bays, even empty carriers without SCSI drives installed must remain in the chassis.

1. To add a new SCSI drive, install a drive into the carrier with the printed circuit board side toward the carrier so that the mounting holes align with those in the carrier.

2. Secure the drive to the carrier with four screws, as shown in Figure 6-3.

Figure 6-3. Mounting a SCSI/SATA Drive in a Carrier



Use caution when working around the SCSI/SATA backplane. Do not touch the backplane with any metal objects and make sure no ribbon cables touch the backplane or obstruct the holes, which aid in proper airflow.

<u>Important:</u> Regardless of how many SCSI/SATA hard drives are installed, all drive carriers must remain in the drive bays for proper airflow.

Installing/Removing SCSI/SATA Drives

The SCSI/SATA drive bays are located in the front of the chassis and are hot-swap units, meaning that they can be installed and removed while the system is running.

1. To remove a SCSI/SATA drive, first push the colored release button located beside the drive's LEDs.

2. Swing the handle fully out and use it to pull the drive carrier straight out (see Figure 6-4).

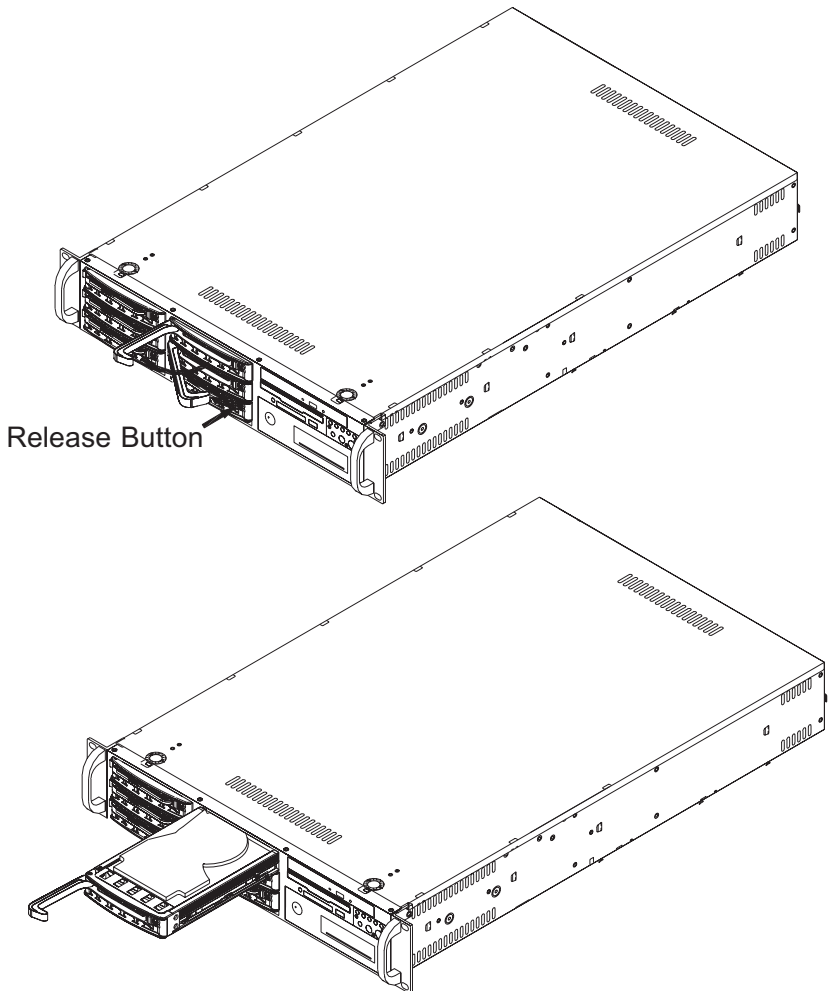


Figure 6-4. Removing SCSI/SATA Drives

<u>Important:</u> All of the SCSI/SATA drive carriers must remain in the drive bay to maintain proper cooling airflow.

Installing Components in the 5.25" Drive Bays

The SC822S-400LP/SC822TQ-400LP chassis has two 5.25" drive bays. Components such as an extra floppy drive or CD-ROM drives can be installed into these 5.25" drive bays.

Removing the Empty Drive Bay

1. First power down the system.
2. Remove the top/left chassis cover to access the drive components.
3. With the cover off, remove the screws that secure the drive carrier to the chassis (one side only) then push the entire empty drive carrier out from the back.

Adding a Slim DVD/CD-ROM Drive

5025B-4

1. Remove the guide plates (one on each side) from the empty drive carrier and screw them into both sides of the DVD/CD-ROM drive using the holes provided.
2. Slide the DVD/CD-ROM into the bay and secure it to the chassis with the drive carrier screws you first removed.
3. Attach the power and data cables to the drive.
4. Replace the top/left chassis cover and restore power to the system.

5025B-T

Because the motherboard does not have an IDE port, adding a DVD/CD-ROM drive to the 5025B-T will occupy one of the SATA ports on the backplane.

1. Add the IDE to SATA adapter (CDM-PSATA) to any one of the SATA ports on the backplane to accommodate the DVD/CD-ROM drive.
2. Follow the procedure above to install the DVD/CD-ROM drive into the same SATA drive bay that you added the adapter to.
3. Attach the power and data cables to the drive.
4. Replace the top/left chassis cover and restore power to the system.

6-5 Power Supply

The SuperServer 5025B-4/5025B-T has a single 400 watt power supply. This power supply module has an auto-switching capability, which enables it to automatically sense and operate at a 100V to 220V input voltage.

Power Supply Failure

If the power supply fails, the system will shut down and you will need to replace the power supply unit. Replacement units can be ordered directly from Supermicro. See contact information in Chapter 1.

Replacing the Power Supply

1. First shut down the system, then unplug the power cord.

2. Remove the chassis cover by pressing the two release buttons on the top of the chassis (near the front) then push the chassis top rearward about one inch and lift it off.

3. To remove the failed power supply, remove the screws at the back that secure it to the chassis and pull the unit straight out with the rounded handle.

4. Replace the failed hot-swap unit with another PWS-401-2H power supply unit. Push the new power supply unit into the power bay until you hear a *click*.

5. Secure the power supply with the screws you removed previously and finish by plugging in the AC power cord.

6. Push the power button to restart the system.

Chapter 7

BIOS

7-1 Introduction

This chapter describes the Phoenix BIOS™ Setup utility for the X7SB4/X7SBE. The Phoenix ROM BIOS is stored in a flash chip and can be easily upgraded using a floppy disk-based program.

Note: Due to periodic changes to the BIOS, some settings may have been added or deleted and might not yet be recorded in this manual. Please refer to the Manual Download area of the Supermicro web site <http://www.supermicro.com> for any changes to the BIOS that may not be reflected in this manual.

System BIOS

BIOS is the Basic Input Output System used in all IBM® PC, XT™, AT®, and PS/2® compatible computers. The Phoenix BIOS stores the system parameters, types of disk drives, video displays, etc. in the CMOS. The CMOS memory requires very little electrical power. When the computer is turned off, a backup battery provides power to the CMOS logic, enabling it to retain system parameters. Each time the computer is powered on the computer is configured with the values stored in the CMOS logic by the system BIOS, which gains control at boot up.

How To Change the Configuration Data

The CMOS information that determines the system parameters may be changed by entering the BIOS Setup utility. This Setup utility can be accessed by pressing the <Delete> key at the appropriate time during system boot. (See below.)

Starting the Setup Utility

Normally, the only visible POST (Power On Self Test) routine is the memory test. As the memory is being tested, press the <Delete> key to enter the main menu of the BIOS Setup utility. From the main menu, you can access the other setup screens, such as the Security and Power menus. Beginning with Section 7-3, detailed descriptions are given for each parameter setting in the Setup utility.

Warning: Do not shut down or reset the system while updating BIOS to prevent possible boot failure.

Note: The SPI BIOS chip used in the X7SB4/X7SBE is not removable. To replace a damaged SPI BIOS chip, please send the motherboard to Supermicro for repair.

7-2 Running Setup

Default settings are in bold text unless otherwise noted.

The BIOS setup options described in this section are selected by choosing the appropriate text from the main BIOS Setup screen. All displayed text is described in this section, although the screen display is often all you need to understand how to set the options (See the next page).

When you first power on the computer, the Phoenix BIOS™ is immediately activated.

While the BIOS is in control, the Setup program can be activated in one of two ways:

1. By pressing <Delete> immediately after turning the system on, or
2. When the message shown below appears briefly at the bottom of the screen during the POST (Power On Self-Test), press the <Delete> key to activate the main Setup menu:

Press the <Delete> key to enter Setup

7-3 Main BIOS Setup

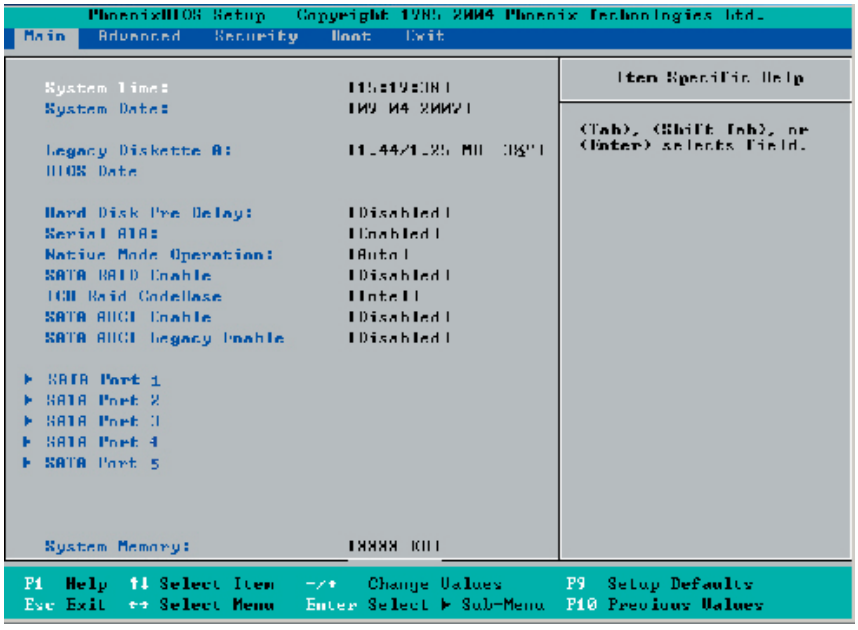
All main Setup options are described in this section. The main BIOS Setup screen is displayed below.

Use the Up/Down arrow keys to move among the different settings in each menu. Use the +/- arrow keys to change the options for each setting.

Press the <Esc> key to exit the CMOS Setup Menu. The next section describes in detail how to navigate through the menus.

Items that use submenus are indicated with the ▶icon. With the item highlighted, press the <Enter> key to access the submenu.

Main BIOS Setup Menu



Main Setup Features

System Time

To set the system date and time, key in the correct information in the appropriate fields. Then press the <Enter> key to save the data.

System Date

Using the arrow keys, highlight the month, day and year fields, and enter the correct data. Press the <Enter> key to save the data.

Legacy Diskette A

This setting allows the user to set the type of floppy disk drive installed as diskette A. The options are Disabled, 360Kb 5.25 in, 1.2MB 5.25 in, 720Kb 3.5 in, **1.44/1.25MB**, 3.5 in and 2.88MB 3.5 in.

BIOS Date

The item displays the date that the BIOS was built.

Hard Disk Pre-Delay

When Enabled, this feature will add a delay to provide time need for HDD self-initialization before the HDD is accessed by the BIOS for the first time. Some HDDs will hang if accessed by the BIOS without proper initialization. The options are 3, 6, 9, 12, 15, 21, 30 (seconds), and **Disabled.**

Serial ATA

This setting allows the user to enable or disable the function of Serial ATA. The options are Disabled and **Enabled.**

Native Mode Operation

Select Serial ATA to use the SATA mode, or select Auto to use the Native Mode for ATA. The options are: Serial ATA and **Auto**.

Serial ATA (SATA) RAID Enable

Select Enable to enable Serial ATA RAID Functions. (For the Windows OS environment, use the RAID driver if this feature is set to Enabled. When this item is set to Enabled, the item: ICH RAID Code Base will be available for you to select either Intel or Adaptec Host RAID firmware to be activated. If this item is set to **Disabled**, the item-SATA AHCI Enable will be available.) The options are Enabled and **Disabled**.

ICH RAID Code Base

Select Intel to enable the Intel SATA RAID firmware. Select Adaptec to use the Adaptec HostRAID firmware. The options are **Intel** and Adaptec**.**

SATA AHCI

Select Enable to enable the function of Serial ATA Advanced Host Interface. (Take caution when using this function. This feature is for advanced programmers only. The Enhanced AHCI mode is available when the Windows XP-SP1 OS and the IAA Driver is used.) The options are Enabled and **Disabled**.

SATA AHCI Legacy

Select Enable to use Legacy Mode for SATA Advanced Host Interfacing. When this feature is set to Enabled, SATA Port 5 and SATA Port 6 are disabled. (Take caution when using this function. This feature is for advanced programmers only.) The options are Enabled and **Disabled**.

▶SATA Port0/SATA Port1/SATA Port2/SATA Port3/SATA Port4/SATA Port5

These settings allow the user to set the parameters of SATA0~SATA 5 connections. Hit <Enter> to activate the following sub-menu screen for detailed options of these items. Set the correct configurations accordingly. The items included in the sub-menu are:

Type

This option allows the user to select the type of a SATA device. Select **Auto** to allow the BIOS to automatically configure the parameters of a SATA device installed on a slot. Select User to allow the user to enter the parameters of the

SATA device installed. Select CDROM if a CDROM drive is installed. Select ATAPI or IDE Removable if a removable disk drive is installed.

CHS Format

The following items will be displayed by the BIOS:

TYPE: This item displays the type of a SATA drive.

Cylinders: This item indicates the number of cylinders detected by the BIOS.

Headers: This item indicates the number of headers.

Sectors: This item displays the number of sectors.

Maximum Capacity: This item displays the maximum storage capacity in the CHS Format.

LBA Format

The following items will be displayed by the BIOS:

Total Sectors: This item displays the number of total sectors available in the LBA Format.

Maximum Capacity: This item displays the maximum capacity in the LBA Format.

Multi-Sector Transfers

This item allows the user to specify the number of sectors per block to be used in multi-sector transfer. The options are Disabled, 2 Sectors, 4 Sectors, 8 Sectors, and **16 Sectors.**

LBA Mode Control

This item determines whether the Phoenix BIOS will access a SATA device via the LBA mode. The options are **Enabled** and Disabled.

32 Bit I/O

This option allows the user to enable or disable the function of 32-bit data transfer. The options are Enabled and **Disabled**.

Transfer Mode

This option allows the user to set the transfer mode. The options are Standard, Fast PIO1, Fast PIO2, Fast PIO3, Fast PIO4, FPIO3/DMA1 and **FPIO4/DMA2**.

Ultra DMA Mode

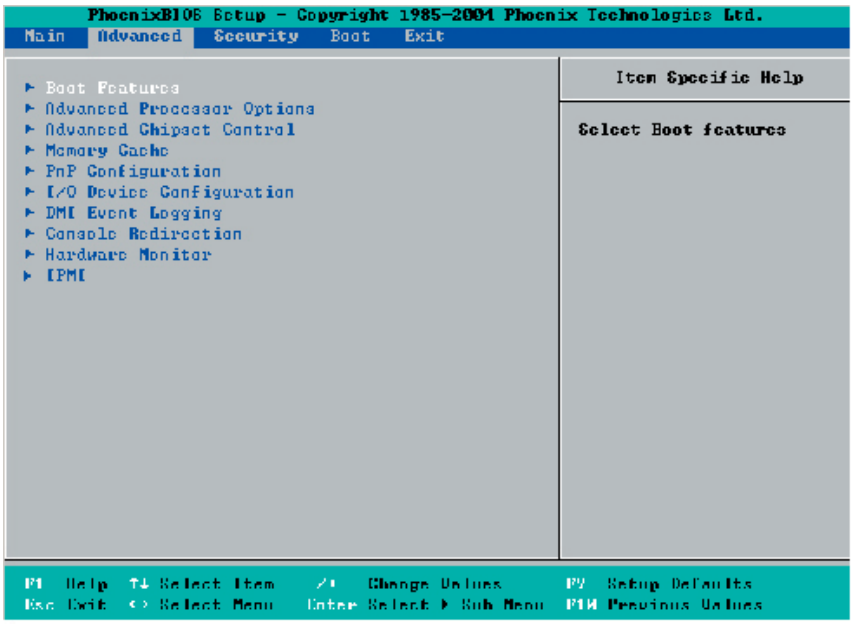
This option allows the user to configure the Ultra DMA Mode setting. The options are Disabled, Mode 0, Mode 1, Mode 2, Mode 3, Mode 4, and **Mode 5**.

System Memory

This display informs you how much system memory is detected in the system.

7-4 Advanced Setup

Choose Advanced from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. The items with a triangle beside them have sub menus that can be accessed by highlighting the item and pressing <Enter>.



▶Boot Features

Access the submenu to make changes to the following settings.

Quiet Mode

This setting allows you to **Enable** or Disable the graphic logo screen during boot-up.

QuickBoot Mode

If enabled, this feature will speed up the POST (Power On Self Test) routine by skipping certain tests after the computer is turned on. The settings are **Enabled** and Disabled. If Disabled, the POST routine will run at normal speed.

ACPI Mode

Select Yes to **use** the ACPI (Advanced Configuration and Power Interface) power management feature on your system. The options are **Yes** and No.

Power Button Behavior

If set to **Instant-Off**, the system will power on or power off immediately as soon as the user hits the power button. The options are **Instant-Off** and 4-Second Override.

Resume On Modem Ring

Select On to "wake your system up" when an incoming call is received by your modem. The options are On and **Off**.

Resume On PME#

Select On to "wake your system up" from the PME# of PCI slots. The options are **On** and Off.

PS2 Keyboard (KB)/Mouse Wake Up

Select Enable to "wake your system up" from the S1, S3, S4 or S5 state. If this feature is set to Enabled, you will also need to enable the JPWAKE jumper by closing pins 1-2. (Please refer to Pg. 1-5 and Chapter 2 for more details). The default setting is **Disabled**.

Power Loss Control

This setting allows you to choose how the system will react when power returns after an unexpected loss of power. The options are Stay Off, Power On, and **Last State**.

Watch Dog

If enabled, this option will automatically reset the system if the system is not active for more than 5 minutes. The options are Enabled and **Disabled**.

Summary Screen

This setting allows you to **Enable** or Disable the summary screen which displays the system configuration during bootup.

▶Advanced Processor Options

Access the submenu to make changes to the following settings.

CPU Speed

This is a display that indicates the speed of the installed processor.

Frequency Ratio (Available when supported by the CPU.)

The feature allows the user to set the internal frequency multiplier for the CPU. The default setting is **Default**.

Frequency High Ratio (Available when supported by the CPU.)

The feature allows the user to set high ratio internal frequency multiplier for Intel SpeedStep CPUs. The default setting is **x12**.

Note: If a wrong ratio that is not supported by the CPU is selected, the system may hang. If this happens, clear CMOS to recover the system.)

Hyper-threading (Available when supported by the CPU.)

Set to Enabled to use the Hyper-Threading Technology, which will result in increased CPU performance. The options are Disabled and **Enabled.**

Core-Multi-Processing (Available when supported by the CPU.)

Set to Enabled to use a processor's Second Core and beyond. (Please refer to Intel's web site for more information.) The options are Disabled and **Enabled.**

Machine Checking (Available when supported by the CPU.)

Set to Enabled to activate the function of Machine Checking and allow the CPU to detect and report hardware (machine) errors via a set of model-specific registers (MSRs). The options are **Enabled** and Disabled.

Compatible FPU Code (Available when supported by the CPU.)

Set to Enabled to keep the content of the last instruction Operating Code (OP Code) in the floating point (FP) state. The options are **Disabled** and Enabled.

L3 Cache(Available when supported by the CPU.)

Set to Enabled to enable the function of L3 Cache to optimize system and CPU performance. The options are Disabled and **Enabled**.

Thermal Management 2 (Available when supported by the CPU.)

Set to **Enabled** to use Thermal Management 2 (TM2) which will lower CPU voltage and frequency when the CPU temperature reaches a predefined overheat threshold. Set to Disabled to use Thermal Manager 1 (TM1), allowing CPU clocking to be regulated via CPU Internal Clock modulation when the CPU temperature reaches the overheat threshold.

Adjacent Cache Line Prefetch (Available when supported by the CPU.)

The CPU fetches the cache line for 64 bytes if this option is set to Disabled. The CPU fetches both cache lines for 128 bytes as comprised if Enabled. The options are Disabled and **Enabled**.

Set Maximum Ext. CPUID=3

When set to Enabled, the Maximum Extended CPUID will be set to 3. The options are **Disabled** and Enabled.

Echo TPR

Set to **Enabled** to prevent xTPR messages from being sent to the system. The options are Disabled and **Enabled**.

C1 Enhanced Mode (Available when supported by the CPU.)

Set to **Enabled** to enable Enhanced Halt State to lower CPU voltage/frequency to prevent overheat. The options are E**nabled** and Disabled. **Note:** please refer to Intel's web site for detailed information.

Intel <R> Virtualization Technology (Available when supported by the CPU.)

Select Enabled to use the feature of Virtualization Technology to allow one platform to run multiple operating systems and applications in independent partitions, creating multiple "virtual" systems in one physical computer. The options are Enabled and **Disabled**. **Note**: If there is any change to this setting, you will need to power off and restart the system for the change to take effect. Please refer to Intel's web site for detailed information.

No Execute Mode Memory Protection (Available when supported by the CPU and the OS.)

Set to Enabled to enable Execute Disable Bit and allow the processor to classify areas in memory where an application code can execute and where it cannot, and thus preventing a worm or a virus from inserting and creating a flood of codes to overwhelm the processor or damage the system during an attack.

Note: this feature is available when your OS and your CPU support the function of Execute Disable Bit. The options are Disabled and **Enabled**. **Note**: For more information regarding hardware/software support for this function, please refer to Intel's and Microsoft's web sites.

Enhanced Intel Speed Step Support (Available when supported by the CPU.)

Select Enabled to use the Enhanced Intel SpeedStep Technology and allows the system to automatically adjust processor voltage and core frequency in an effort to reduce power consumption and heat dissipation. The default setting is **GV1/GV3**. Please refer to Intel's web site for detailed information.

▶Advanced Chipset Control

Access the submenu to make changes to the following settings.

Warning: Take Caution when changing the Advanced settings. An incorrect value, a very high DRAM frequency, or an incorrect DRAM timing may cause the system to become unstable. When this occurs, reset the setting to the default setting.

Memory Reclaiming

Select Enable to enable the functionality of Memory Remapping above 4GB. The settings are **Enabled** and Disabled.

Enable VT-d

Select Enable to enable the functionality of the Intel Virtualization Technology for Direct I/O support, which offers fully-protected I/O resource-sharing across the Intel platforms, providing the user with greater reliability, security and availability in networking and data-sharing. The settings are Enabled and **Disabled**.

High Precision Event Time

Select Yes to activate the High Precision Event Timer (HPET), which is capable of producing periodic interrupts at a much higher frequency than a Real-time Clock (RTC) can in synchronizing multimedia streams, providing smooth playback and reducing the dependency on other timestamp calculation devices, such as an x86 RDTSC Instruction embedded in a CPU. The High Precision Event Timer is used to replace the 8254 Programmable Interval Timer. The options for this feature are Yes and **No**.

Route Port 80h Cycles to

This feature allows the user to decide which bus to send debug information to. The options are PCI and **LPC**.

Legacy USB Support

This setting allows you to enable support for Legacy USB devices. The settings are **Enabled** and Disabled.

USB Host Controller 1

This feature allows the user to configure the USB Host Controller setting for USB Device #29 Functions 0, 1, 2, 3, 7. The options are **Enabled** and Disabled.

USB Host Controller 2

This feature allows the user to configure the USB Host Controller setting for USB Device #26 Functions 0, 1, 2, 7. The options are **Enabled** and Disabled.

▶Memory Cache

Cache System BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a System BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable this function, and this area will be reserved for BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Video BIOS Area

This setting allows you to designate a reserve area in the system memory to be used as a Video BIOS buffer to allow the BIOS to write (cache) data into this reserved memory area. Select **Write Protect** to enable the function and this area will be reserved for Video BIOS ROM access only. Select Uncached to disable this function and make this area available for other devices.

Cache Base 0-512K

If enabled, this feature will allow the data stored in the base memory area: block 0-512K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or to be written into the L1, L2 cache inside the CPU to speed up CPU operations . Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 0-512K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Base 512K-640K

If enabled, this feature will allow the data stored in the memory area: 512K-640K to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into the L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the base memory area of Block 512K-640K. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

Cache Extended Memory

If enabled, this feature will allow the data stored in the extended memory area to be cached (written) into a buffer, a storage area in the Static DROM (SDROM) or written into the L1, L2, L3 cache inside the CPU to speed up CPU operations. Select Uncached to disable this function. Select Write Through to allow data to be cached into the buffer and written into the system memory at the same time. Select Write Protect to prevent data from being written into the extended memory area above 1 MB. Select Write Back to allow the CPU to write data back directly from the buffer without writing data to the System Memory for fast CPU data processing and operation. The options are Uncached, Write Through, Write Protect, and **Write Back**.

▶PnP Configuration

Access the submenu to make changes to the following settings for PCI devices.

PCI-X(s) Frequency

When set to **Enabled,** this feature allows the user to set the bus frequency for a PCI-X slot for it to work properly. The default setting is **Auto**.

▶Slot 1 PCI-X 100 MHz/Slot 2 PCI-X 100 MHz ZCR

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

(ZCR slot is available on the X7SB4 only.)

▶Slot 4 PCI-Exp. x4/Slot 7 PCI-Exp. x4

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

▶Slot 5 PCI-X 133 MHz/Slot 6 PCI-X 133 MHz

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are **Enabled** and Disabled.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

▶Onboard LAN 1/Onboard LAN 2

Access the submenu for each of the settings above to make changes to the following:

Option ROM Scan

When enabled, this setting will initialize the device expansion ROM. The options are Enabled and **Disabled**.

Enable Master

This setting allows you to enable the selected device as the PCI bus master. The options are Enabled and **Disabled**.

Latency Timer

This setting allows you to set the clock rate for Bus Master. A high-priority, high-throughout device may benefit from a greater clock rate. The options are **Default**, 0020h, 0040h, 0060h, 0080h, 00A0h, 00C0h, and 00E0h. For Unix, Novelle and other Operating Systems, please select the option: other. If a drive fails after the installation of a new software, you might want to change this setting and try again. A different OS requires a different Bus Master clock rate**.**

▶I/O Device Configuration

Access the submenu to make changes to the following settings.

KBC Clock Input

This setting allows you to select clock frequency for the keyboard clock. The options are 6MHz, 8MHz, **12MHz,** and 16MHz.

Serial Port A

This setting allows you to assign control of Serial Port A. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- or OS- controlled).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port A. The options are **3F8**, 2F8, 3E8, and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port A. The options are IRQ3 and **IRQ4**.

Serial Port B

This setting allows you to assign control of Serial Port B. The options are **Enabled** (user defined), Disabled, Auto (BIOS controlled) and OS Controlled.

Mode

This setting allows you to set the type of device that will be connected to Serial Port B. The options are **Normal** and IR (for an infrared device).

Base I/O Address

This setting allows you to select the base I/O address for Serial Port B. The options are 3F8, **2F8**, 3E8 and 2E8.

Interrupt

This setting allows you to select the IRQ (interrupt request) for Serial Port B. The options are **IRQ3** and IRQ4.

Floppy Disk Controller

This setting allows you to assign control of the floppy disk controller. The options are **Enabled** (user defined), Disabled, and Auto (BIOS- and OS- controlled).

▶DMI Event Logging

Access the submenu to make changes to the following settings.

Event Log Validity

This is a display to inform you of the event log validity. It is not a setting.

Event Log Capacity

This is a display to inform you of the event log capacity. It is not a setting.

View DMI Event Log

Highlight this item and press <Enter> to view the contents of the event log.

Event Logging

This setting allows you to **Enable** or Disable event logging.

Mark DMI Events as Read

Highlight this item and press <Enter> to mark the DMI events as read.

Clear All DMI Event Logs

Select Yes and press <Enter> to clear all DMI event logs. The options are Yes and **No**.

▶Console Redirection

Access the submenu to make changes to the following settings.

COM Port Address

This item allows you to specify which COM port to direct the remote console to: Onboard COM A or Onboard COM B. This setting can also be **Disabled**.

BAUD Rate

This item allows you to set the BAUD rate for the console redirection. The options are 300, 1200, 2400, 9600, **19.2K**, 38.4K, 57.6K, and 115.2K.

Console Type

This item allows you to set the console redirection type. The options are VT100, VT100,8bit, PC-ANSI, 7bit, **PC ANSI**, VT100+, VT-UTF8 and ASCII.

Flow Control

This item allows you to select the flow control option for the console. The options are: None, XON/XOFF, and **CTS/RTS**.

Console Connection

This item allows you to decide how console redirection is to be connected: either **Direct** or Via Modem.

Continue CR after POST

This feature allows you to decide if you want to continue with console redirection after the POST routine. The options are On and **Off**.

▶Hardware Monitoring

CPU Temperature

CPU Overheat Temperature

This item is for display only. The default setting is **75°C.** (See the note below.)

Highlight this and hit <Enter> to see monitor data for the following items:

CPU Temperature

System Temperature

CPU Fan/Fan 1 to Fan 5

If the feature of Auto Fan Control is enabled, the BIOS will automatically display the status of each fan as specified.

Fan Speed Control Modes

This item allows the user to decide how the system controls the speeds of the onboard fans. The CPU temperature and the fan speed are correlative. When the CPU on-die temperature increases, the fan speed will also increase, and vice versa. If the option is set to 3-pin fan, the fan speed is controlled by voltage. If the option is set to 4-pin, the fan speed will be controlled by Pulse Width Modulation (PWM). Select 3-pin if your chassis came with 3-pin fan headers. Select 4-pin if your chassis came with 4-pin fan headers. Select Workstation if your system is used as a Workstation. Select Server if your system is used as a Server. Select Disable to disable the fan speed control function to allow the onboard fans to constantly run at the full speed (12V). The Options are: **1. Disable**, 2. Optimized Server w/3-pin, 3. Optimized Workstation w/3-pin, 4. Optimized Server w/4-pin and 5. Optimized Workstation w/4-pin.

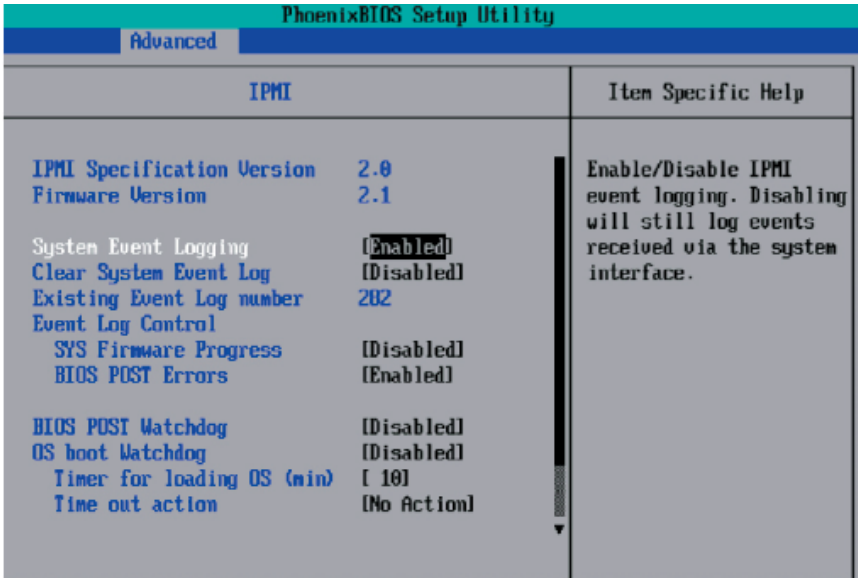
Voltage Monitoring

The following items will be monitored and displayed:

Vcore A, MCH Core, -12V, VDIMM, +3.3V, +12V, +5Vsb, +5VDD, P_VTT, Vbat

Note: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

▶IPMI (The option is available only when an IPMI card is installed in the system.)


PhoenixBIOS Setup Utility
Advanced
IPMI
Item Specific Help
IPMI Specification Version 2.0
Firmware Version 2.1
System Event Logging [Enabled]
Clear System Event Log [Disabled]
Existing Event Log number 202
Event Log Control
SYS Firmware Progress [Disabled]
BIOS POST Errors [Enabled]
BIOS POST Watchdog [Disabled]
OS boot Watchdog [Disabled]
Timer for loading OS (min) [10]
Time out action [No Action]
Enable/Disable IPMI event logging. Disabling will still log events received via the system interface.

IPMI Specification Version: This item displays the current IPMI Version.

Firmware Version: This item displays the current Firmware Version.

System Event Logging

Select Enabled to enable IPMI Event Logging. When this function is set to Disabled, the system will continue to log events received via system interface. The options are **Enabled** and Disabled.

Clear System Event Logging

Enabling this function to force the BIOS to clear the system event logs during the next cold boot. The options are Enabled and **Disabled**.

Existing Event Log Number

This item displays the number of the existing event log.

Event Log Control

System Firmware Progress

Enabling this function to log POST progress. The options are Enabled and **Disabled**.

BIOS POST Errors

Enabling this function to log POST errors. The options are Enabled and **Disabled**.

BIOS POST Watch Dog

Set to Enabled to enable POST Watch Dog. The options are Enabled and **Disabled**.

OS Boot Watch Dog

Set to Enabled to enable OS Boot Watch Dog. The options are Enabled and **Disabled**.

Timer for Loading OS (Minutes)

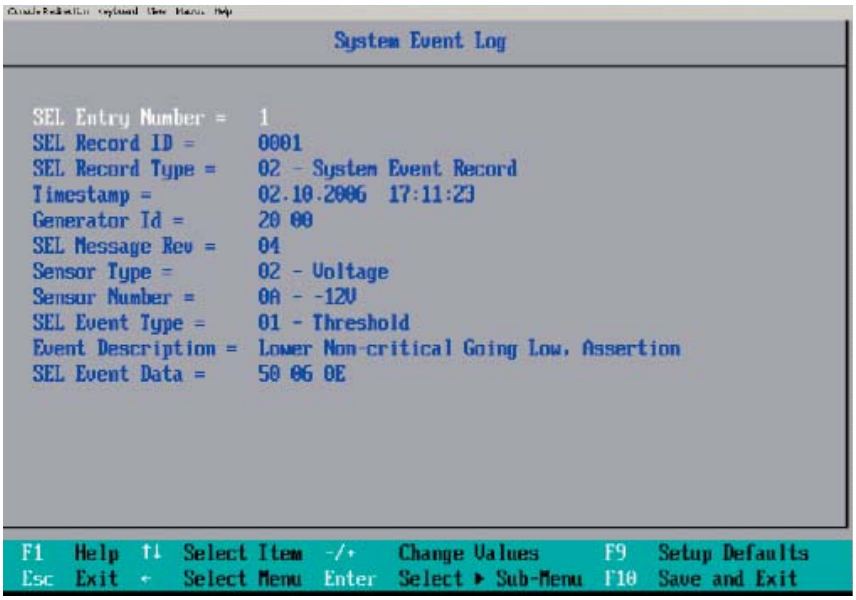
This feature allows the user to set the time value (in minutes) for the previous item: OS Boot Watch Dog by keying-in a desired number in the blank. The default setting is 10 (minutes.) (Please ignore this option when OS Boot Watch Dog is set to "Disabled".)

Time Out Option

This feature allows the user to determine what action to take in an event of a system boot failure. The options are **No Action,** Reset, Power Off and Power Cycles.

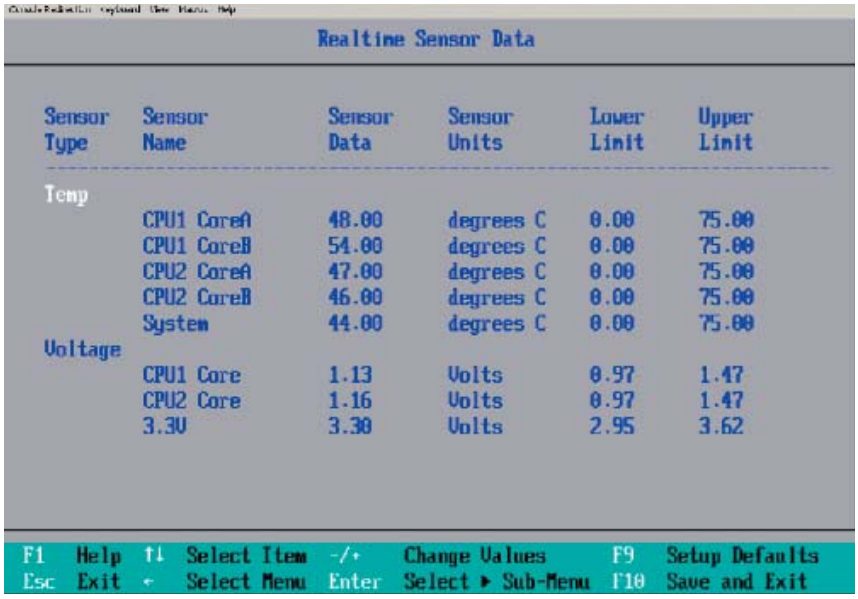
▶System Event Log/System Event Log (List Mode)

These options display the System Event (SEL) Log and System Event (SEL) Log in List Mode. Items include: SEL (System Event Log) Entry Number, SEL Record ID, SEL Record Type, Time Stamp, Generator ID, SEL Message Revision, Sensor Type, Sensor Number, SEL Event Type, Event Description, and SEL Event Data.


System Event Log
SEL Entry Number = 1
SEL Record ID = 0001
SEL Record Type = 02 - System Event Record
Timestamp = 02.10.2006 17:11:23
Generator Id = 20 00
SEL Message Rev = 04
Sensor Type = 02 - Voltage
Sensor Number = 0A - -12V
SEL Event Type = 01 - Threshold
Event Description = Lower Non-critical Going Low, Assertion
SEL Event Data = 50 06 0E
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

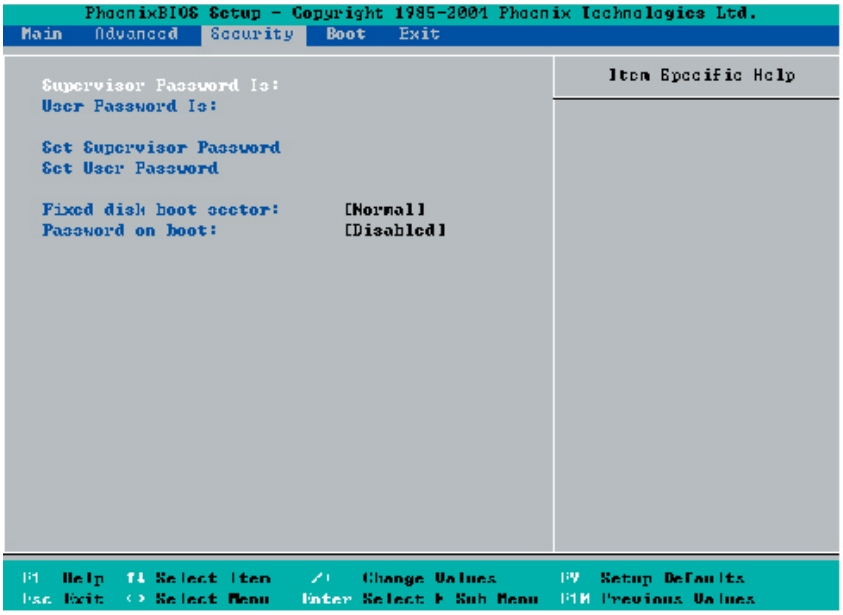
▶Realtime Sensor Data

This feature display information from motherboard sensors, such as temperatures, fan speeds and voltages of various components.


Realtime Sensor Data
Sensor Type
Sensor Name
Sensor Data
Sensor Units
Lower Limit
Upper Limit
Temp
CPU1 CoreA 48.00 degrees C 0.00 75.00
CPU1 CoreB 54.00 degrees C 0.00 75.00
CPU2 CoreA 47.00 degrees C 0.00 75.00
CPU2 CoreB 46.00 degrees C 0.00 75.00
System 44.00 degrees C 0.00 75.00
Voltage
CPU1 Core 1.13 Volts 0.97 1.47
CPU2 Core 1.16 Volts 0.97 1.47
3.3V 3.30 Volts 2.95 3.62
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

7-5 Security Settings

Choose Security from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. Security setting options are displayed by highlighting the setting using the arrow keys and pressing <Enter>. All Security BIOS settings are described in this section.


PhoenixBIOS Setup - Copyright 1985-2001 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Item Specific Help
Supervisor Password Is:
User Password Is:
Set Supervisor Password
Set User Password
Fixed disk boot sector: [Normal]
Password on boot: [Disabled]

Supervisor Password Is:

This item indicates if a supervisor password has been entered for the system. Clear means such a password has not been used and Set means a supervisor password has been entered for the system.

User Password Is:

This item indicates if a user password has been entered for the system. Clear means such a password has not been used and Set means a user password has been entered for the system.

Set Supervisor Password

When the item "Set Supervisor Password" is highlighted, hit the <Enter> key. When prompted, type the Supervisor's password in the dialogue box to set or to change supervisor's password, which allows access to the BIOS.

Set User Password

When the item "Set User Password" is highlighted, hit the <Enter> key. When prompted, type the user's password in the dialogue box to set or to change the user's password, which allows access to the system at boot-up.

Fixed Disk Boot Sector

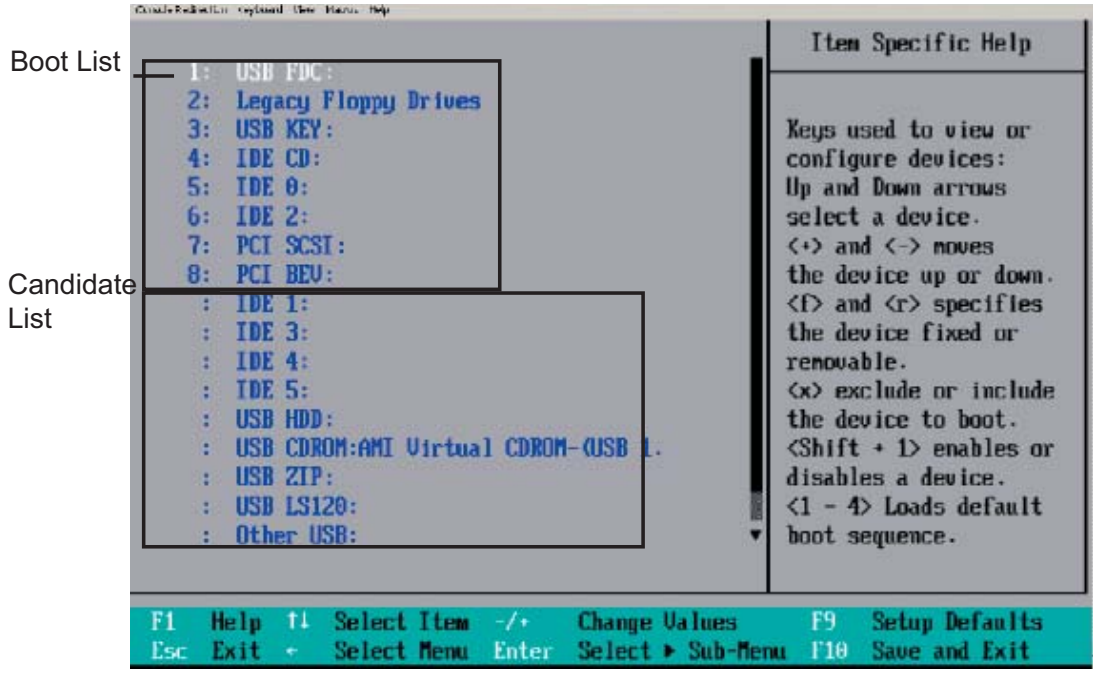
Select **Normal** to enable the feature of Write-Protect to protect the boot sector on the hard drives from virus intrusion.

Password on Boot

When set to Enabled, a user will need to key-in a password to enter the system at system boot. The options are Enabled (password required) and Disabled (password not required).

7-6 Boot Settings

Choose Boot from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. See details on how to change the order and specs of boot devices in the Item Specific Help window.

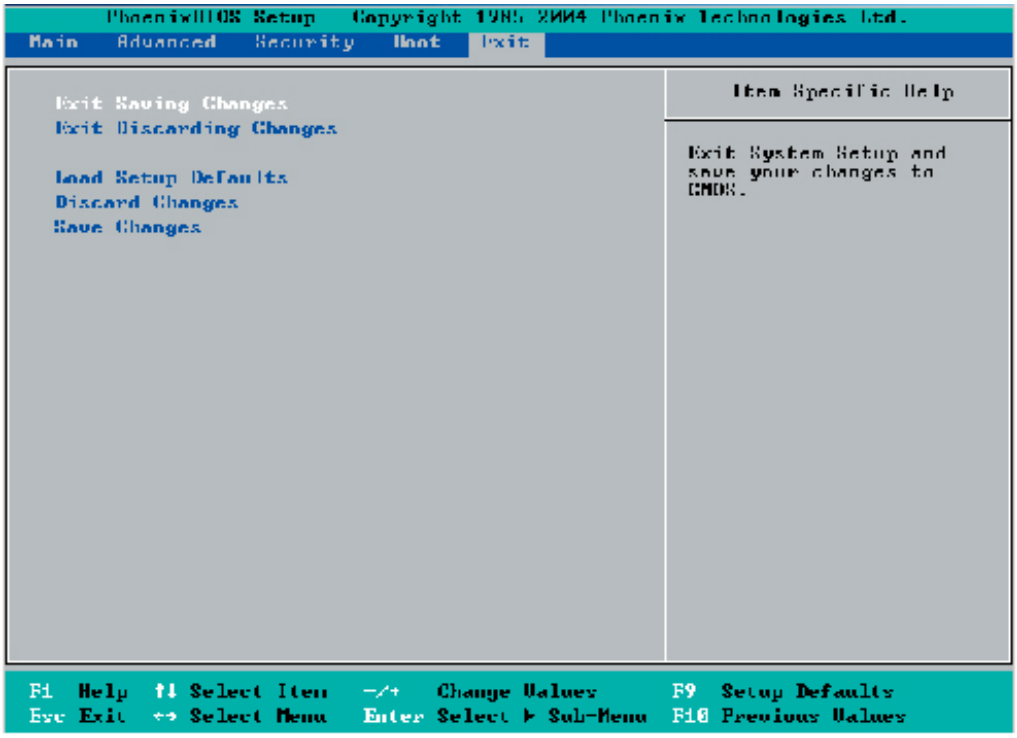

Boot List
Candidate List
1: USB FDC:
2: Legacy Floppy Drives
3: USB KEY:
4: IDE CD:
5: IDE 0:
6: IDE 2:
7: PCI SCSI:
8: PCI BEV:
: IDE 1:
: IDE 3:
: IDE 4:
: IDE 5:
: USB HDD:
: USB CDROM:AMI Virtual CDROM-(USB 1.
: USB ZIP:
: USB LS120:
: Other USB:
Item Specific Help
Keys used to view or configure devices:
Up and Down arrows select a device.
<+> and <-> moves the device up or down.
<f> and <r> specifies the device fixed or removable.
<x> exclude or include the device to boot.
<Shift + 1> enables or disables a device.
<1 - 4> Loads default boot sequence.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ← Select Menu Enter Select ▸ Sub-Menu F10 Save and Exit

Boot Priority Order/Excluded from Boot Orders

The devices included in the boot list section (above) are bootable devices listed in the sequence of boot order as specified. The boot functions for the devices included in the candidate list (above) are currently disabled. Use a <+> key or a <-> key to move the device up or down. Use the <f> key or the <r> key to specify the type of an USB device, either fixed or removable. You can select one item from the boot list and hit the <x> key to remove it from the list of bootable devices (to make its resource available for other bootable devices). Subsequently, you can select an item from the candidate list and hit the <x> key to remove it from the candidate list and put it in the boot list. This item will then become a bootable device. See details on how to change the priority of boot order of devices in the "Item Specific Help" window.

7-7 Exit

Choose Exit from the Phoenix BIOS Setup Utility main menu with the arrow keys. You should see the following display. All Exit BIOS settings are described in this section.


PhoenixBIOS Setup Copyright 1985-2004 Phoenix Technologies Ltd.
Main Advanced Security Boot Exit
Exit Saving Changes
Exit Discarding Changes
Load Setup Defaults
Discard Changes
Save Changes
Item Specific Help
Exit System Setup and save your changes to CMOS.
F1 Help ↑↓ Select Item -/+ Change Values F9 Setup Defaults
Esc Exit ↔ Select Menu Enter Select ▶ Sub-Menu F10 Previous Values

Exit Saving Changes

Highlight this item and hit <Enter> to save any changes you made and to exit the BIOS Setup utility.

Exit Discarding Changes

Highlight this item and hit <Enter> to exit the BIOS Setup utility without saving any changes you may have made.

Load Setup Defaults

Highlight this item and hit <Enter> to load the default settings for all items in the BIOS Setup. These are the safest settings to use.

Discard Changes

Highlight this item and hit <Enter> to discard (cancel) any changes you made. You will remain in the Setup utility.

Save Changes

Highlight this item and hit <Enter> to save any changes you made. You will remain in the Setup utility.

Appendix A

BIOS POST Messages

During the Power-On Self-Test (POST), the BIOS will check for problems. If a problem is found, the BIOS will activate an alarm or display a message. The following is a list of such BIOS messages.

Failure Fixed Disk
Fixed disk is not working or not configured properly. Check to see if fixed disk is attached properly. Run Setup. Find out if the fixed-disk type is correctly identified.

Stuck key
Stuck key on keyboard.

Keyboard error
Keyboard not working.

Keyboard Controller Failed
Keyboard controller failed test. May require replacing keyboard controller.

Keyboard locked - Unlock key switch
Unlock the system to proceed.

Monitor type does not match CMOS - Run SETUP
Monitor type not correctly identified in Setup

Shadow Ram Failed at offset: nnnn
Shadow RAM failed at offset **nnnn** of the 64k block at which the error was detected.

System RAM Failed at offset: nnnn
System RAM failed at offset **nnnn** of in the 64k block at which the error was detected.

Extended RAM Failed at offset: nnnn Extended memory not working or not configured properly at offset **nnnn.**

System battery is dead - Replace and run SETUP
The CMOS clock battery indicator shows the battery is dead. Replace the battery and run Setup to reconfigure the system.

System CMOS checksum bad - Default configuration used
System CMOS has been corrupted or modified incorrectly, perhaps by an application program that changes data stored in CMOS. The BIOS installed Default Setup Values. If you do not want these values, enter Setup and enter your own values. If the error persists, check the system battery or contact your dealer.

System timer error
The timer test failed. Requires repair of system board.

Real time clock error
Real-Time Clock fails BIOS hardware test. May require board repair.

Check date and time settings
BIOS found date or time out of range and reset the Real-Time Clock. May require setting legal date (1991-2099).

Previous boot incomplete - Default configuration used
Previous POST did not complete successfully. POST loads default values and offers to run Setup. If the failure was caused by incorrect values and they are not corrected, the next boot will likely fail. On systems with control of **wait states**, improper Setup settings can also terminate POST and cause this error on the next boot. Run Setup and verify that the waitstate configuration is correct. This error is cleared the next time the system is booted.

Memory Size found by POST differed from CMOS
Memory size found by POST differed from CMOS.

Diskette drive A error
Diskette drive B error
Drive A: or B: is present but fails the BIOS POST diskette tests. Check to see that the drive is defined with the proper diskette type in Setup and that the diskette drive is attached correctly.

Incorrect Drive A type - run SETUP
Type of floppy drive A: not correctly identified in Setup.

Incorrect Drive B type - run SETUP
Type of floppy drive B: not correctly identified in Setup.

System cache error - Cache disabled
RAM cache failed and BIOS disabled the cache. On older boards, check the cache jumpers. You may have to replace the cache. See your dealer. A disabled cache slows system performance considerably.

CPU ID:
CPU socket number for Multi-Processor error.

EISA CMOS not writeable
ServerBIOS2 test error: Cannot write to EISA CMOS.

DMA Test Failed
ServerBIOS2 test error: Cannot write to extended **DMA** (Direct Memory Access) registers.

Software NMI Failed
ServerBIOS2 test error: Cannot generate software NMI (Non-Maskable Interrupt).

Fail-Safe Timer NMI Failed
ServerBIOS2 test error: Fail-Safe Timer takes too long.

Device Address Conflict
Address conflict for specified **device.**

Allocation Error for: device
Run ISA or EISA Configuration Utility to resolve resource conflict for the specified **device**.

CD ROM Drive
CD ROM Drive identified.

Entering SETUP ...
Starting Setup program

Failing Bits: nnnn
The hex number **nnnn** is a map of the bits at the RAM address which failed the memory test. Each 1 (one) in the map indicates a failed bit. See errors 230, 231, or 232 above for offset address of the failure in System, Extended, or Shadow memory.

Fixed Disk n
Fixed disk **n** (0-3) identified.

Invalid System Configuration Data
Problem with NVRAM (CMOS) data.

I/O device IRQ conflict
I/O device IRQ conflict error.

PS/2 Mouse Boot Summary Screen:
PS/2 Mouse installed.

nnnn kB Extended RAM Passed
Where **nnnn** is the amount of RAM in kilobytes successfully tested.

nnnn Cache SRAM Passed
Where **nnnn** is the amount of system cache in kilobytes successfully tested.

nnnn kB Shadow RAM Passed
Where **nnnn** is the amount of shadow RAM in kilobytes successfully tested.

nnnn kB System RAM Passed
Where **nnnn** is the amount of system RAM in kilobytes successfully tested.

One or more I2O Block Storage Devices were excluded from the Setup Boot Menu
There was not enough room in the IPL table to display all installed I2O block-storage devices.

Operating system not found
Operating system cannot be located on either drive A: or drive C:. Enter Setup and see if fixed disk and drive A: are properly identified.

Parity Check 1 nnnn
Parity error found in the system bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.** Parity is a method for checking errors in binary data. A parity error indicates that some data has been corrupted.

Parity Check 2 nnnn
Parity error found in the I/O bus. BIOS attempts to locate the address and display it on the screen. If it cannot locate the address, it displays **????.**

Press <F1> to resume, <F2> to Setup, <F3> for previous
Displayed after any recoverable error message. Press <F1> to start the boot process or <F2> to enter Setup and change the settings. Press <F3> to display the previous screen (usually an initialization error of an **Option ROM**, i.e., an add-on card). Write down and follow the information shown on the screen.

Press <F2> to enter Setup

Optional message displayed during POST. Can be turned off in Setup.

PS/2 Mouse:

PS/2 mouse identified.

Run the I2O Configuration Utility

One or more unclaimed block storage devices have the Configuration Request bit set in the LCT. Run an I2O Configuration Utility (e.g. the SAC utility).

System BIOS shadowed

System BIOS copied to shadow RAM.

UMB upper limit segment address: *nnnn*

Displays the address ***nnnn*** of the upper limit of **Upper Memory Blocks**, indicating released segments of the BIOS which can be reclaimed by a virtual memory manager.

Video BIOS shadowed

Video BIOS successfully copied to shadow RAM.

Notes

Appendix B

BIOS POST Codes

This section lists the POST (Power On Self Test) codes for the Phoenix BIOS. POST codes are divided into two categories: recoverable and terminal.

Recoverable POST Errors

When a recoverable type of error occurs during POST, the BIOS will display an POST code that describes the problem. BIOS may also issue one of the following beep codes:

1 long and two short beeps - video configuration error
1 repetitive long beep - no memory detected

Terminal POST Errors

If a terminal type of error occurs, BIOS will shut down the system. Before doing so, BIOS will write the error to port 80h, attempt to initialize video and write the error in the top left corner of the screen. The following is a list of codes that may be written to port 80h.

POST Code	Description
01h	IPMI Initialization
02h	Verify Real Mode
03h	Disable Non-Maskable Interrupt (NMI)
04h	Get CPU type
06h	Initialize system hardware
07h	Disable shadow and execute code from the ROM.
08h	Initialize chipset with initial POST values
09h	Set IN POST flag
0Ah	Initialize CPU registers
0Bh	Enable CPU cache
0Ch	Initialize caches to initial POST values
0Eh	Initialize I/O component
0Fh	Initialize the local bus IDE
10h	Initialize Power Management
11h	Load alternate registers with initial POST values
12h	Restore CPU control word during warm boot
13h	Reset PCI Bus Mastering devices
14h	Initialize keyboard controller
16h	1-2-2-3 BIOS ROM checksum
17h	Initialize cache before memory Auto size

POST Code	Description
18h	8254 timer initialization
1Ah	8237 DMA controller initialization
1Ch	Reset Programmable Interrupt Controller
20h	1-3-1-1 Test DRAM refresh
22h	1-3-1-3 Test 8742 Keyboard Controller
24h	Set ES segment register to 4 GB
28h	Auto size DRAM
29h	Initialize POST Memory Manager
2Ah	Clear 512 kB base RAM
2Ch	1-3-4-1 RAM failure on address line ***xxxx****
2Eh	1-3-4-3 RAM failure on data bits ***xxxx**** of low byte of memory bus
2Fh	Enable cache before system BIOS shadow
32h	Test CPU bus-clock frequency
33h	Initialize Phoenix Dispatch Manager
36h	Warm start shut down
38h	Shadow system BIOS ROM
3Ah	Auto size cache
3Ch	Advanced configuration of chipset registers
3Dh	Load alternate registers with CMOS values
41h	Initialize extended memory for RomPilot (optional)
42h	Initialize interrupt vectors
45h	POST device initialization
46h	2-1-2-3 Check ROM copyright notice
48h	Check video configuration against CMOS
49h	Initialize PCI bus and devices
4Ah	Initialize all video adapters in system
4Bh	QuietBoot start (optional)
4Ch	Shadow video BIOS ROM
4Eh	Display BIOS copyright notice
4Fh	Initialize MultiBoot
50h	Display CPU type and speed
51h	Initialize EISA board (optional)
52h	Test keyboard
54h	Set key click if enabled
55h	Enable USB devices
58h	2-2-3-1 Test for unexpected interrupts
59h	Initialize POST display service
5Ah	Display prompt “Press <ESC> to enter SETUP”
5Bh	Disable CPU cache

POST Code	Description
5Ch	Test RAM between 512 and 640 kB
60h	Test extended memory
62h	Test extended memory address lines
64h	Jump to UserPatch1
66h	Configure advanced cache registers
67h	Initialize Multi Processor APIC
68h	Enable external and CPU caches
69h	Setup System Management Mode (SMM) area
6Ah	Display external L2 cache size
6Bh	Load custom defaults (optional)
6Ch	Display shadow-area message
70h	Display error messages
72h	Check for configuration errors
76h	Check for keyboard errors
7Ch	Set up hardware interrupt vectors
7Dh	Initialize Intelligent System Monitoring (optional)
7Eh	Initialize coprocessor if present
80h	Disable onboard Super I/O ports and IRQs (optional)
81h	Late POST device initialization
82h	Detect and install external RS232 ports
83h	Configure non-MCD IDE controllers
84h	Detect and install external parallel ports
85h	Initialize PC-compatible PnP ISA devices
86h	Re-initialize onboard I/O ports.
87h	Configure Motherboard Configurable Devices (optional)
88h	Initialize BIOS Data Area
89h	Enable Non-Maskable Interrupts (NMIs)
8Ah	Initialize Extended BIOS Data Area
8Bh	Test and initialize PS/2 mouse
8Ch	Initialize floppy controller
8Fh	Determine number of ATA drives (optional)
90h	Initialize hard-disk controllers
91h	Initialize local-bus hard-disk controllers
92h	Jump to UserPatch2
93h	Build MPTABLE for multi-processor boards
95h	Install CD ROM for boot
96h	Clear huge ES segment register
97h	Fix up Multi Processor table
98h	1-2 Search for option ROMs and shadow if successful. One long, two short beeps on checksum failure

POST Code	Description
99h	Check for SMART Drive (optional)
9Ch	Set up Power Management
9Dh	Initialize security engine (optional)
9Eh	Enable hardware interrupts
9Fh	Determine number of ATA and SCSI drives
A0h	Set time of day
A2h	Check key lock
A4h	Initialize typematic rate
A8h	Erase <ESC> prompt
AAh	Scan for <ESC> key stroke
ACh	Enter SETUP
AEh	Clear Boot flag
B0h	Check for errors
B1h	Inform RomPilot about the end of POST (optional)
B2h	POST done - prepare to boot operating system
B4h	1 One short beep before boot
B5h	Terminate QuietBoot (optional)
B6h	Check password (optional)
B7h	Initialize ACPI BIOS and PPM Structures
B9h	Prepare Boot
BAh	Initialize SMBIOS
BCh	Clear parity checkers
BDh	Display MultiBoot menu
BEh	Clear screen (optional)
BFh	Check virus and backup reminders
C0h	Try to boot with INT 19
C1h	Initialize POST Error Manager (PEM)
C2h	Initialize error logging
C3h	Initialize error display function
C4h	Initialize system error flags
C6h	Console redirection init.
C7h	Unhook INT 10h if console redirection enabled
C8h	Force check (optional)
C9h	Extended ROM checksum (optional)
CDh	Reclaim console redirection vector
D2h	Unknown interrupt
D4h	Check Intel Branding string
D8h	Alert Standard Format initialization
D9h	Late init for IPMI
DEh	Log error if micro-code not updated properly

The following are for boot block in Flash ROM

POST Code	Description
E0h	Initialize the chipset
E1h	Initialize the bridge
E2h	Initialize the CPU
E3h	Initialize system timer
E4h	Initialize system I/O
E5h	Check force recovery boot
E6h	Checksum BIOS ROM
E7h	Go to BIOS
E8h	Set Huge Segment
E9h	Initialize Multi Processor
EAh	Initialize OEM special code
EBh	Initialize PIC and DMA
ECh	Initialize Memory type
EDh	Initialize Memory size
EEh	Shadow Boot Block
EFh	System memory test
F0h	Initialize interrupt vectors
F1h	Initialize Run Time Clock
F2h	Initialize video
F3h	Initialize System Management Manager
F4h	Output one beep
F5h	Clear Huge Segment
F6h	Boot to Mini DOS
F7h	Boot to Full DOS

If the BIOS detects errors on 2C, 2E, or 30 (base 512K RAM error), it displays an additional word-bitmap (***xxxx***) to indicate the address line or bits that have failed. For example, “2C 0002” means address line 1 (bit one set) has failed. “2E 1020" means data bits 12 and 5 (bits 12 and 5 set) have failed in the lower 16 bits. The BIOS also sends the bitmap to the port-80 LED display. It first displays the checkpoint code, followed by a delay, the high-order byte, another delay, and then the loworder byte of the error. It repeats this sequence continuously.

Notes

Appendix C

Intel HostRAID Setup Guidelines

After all the hardware has been installed, you must first configure the Intel ICH9R SATA RAID* Settings before you install the Windows Operating System and other software drivers.

Note: If you do not wish to configure onboard SATA RAID functions, please go directly to Section C-2 and Appendix E for the Operating System & Other Software Installation.

C-1 Introduction to Serial ATA and Parallel ATA

To configure the SATA RAID functions, you must first use the Intel ICH9R SATA RAID Utility program to configure the RAID Level that you desire before installing the Windows XP/2000/2003 operating system and other software drivers. (The necessary drivers are all included on the Supermicro CD that came packaged with your motherboard.) **Note:** the current version of the ICH9R SATA RAID Utility can only support Windows XP/2000/2003 Operating Systems.

Serial ATA (SATA)

Serial ATA (SATA) is a physical storage interface that uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link, which supports transfer rates up to 3Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA (PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA are limited to a length of 40cm, while Serial ATA cables can be up to one meter in length. Overall, SATA provides better functionality than PATA.

Introduction to the Intel ICH9R Serial RAID Setup

Located in the South Bridge of the Intel 3210 Chipset, the I/O Controller Hub (ICH9R) provides the I/O subsystem with access to the rest of the system. It supports six Serial ATA (SATA) ports. The ICH9R supports the following SATA device configurations: Legacy mode and Native mode.

RAID Configurations

The following types of RAID configurations are supported:

RAID 0 (Data Striping): this writes data in parallel, interleaved ("striped") sections of two hard drives. Data transfer rate is doubled over using a single disk.

RAID 1 (Data Mirroring): an identical data image from one drive is copied to another drive. The second drive must be the same size or larger than the first drive.

RAID 10 (Striping & Mirroring): RAID 0 and 1 schemes are combined (without parity information) to get the benefits of both.

RAID 5: both data and parity information are striped and mirrored across three or more hard drives.

Intel Matrix Storage

The Intel Matrix Storage, supported by the ICH9R, allows the user to create RAID 0 and RAID1 set by using only two identical hard disk drives. The Intel Matrix Storage Technology creates two partitions on each hard disk drive and generate a virtual RAID0 and RAID1 sets. It also allows you the change the HDD partition size without any data.

Configuring BIOS settings for SATA RAID Functions (Native Mode)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA Control Mode" and press the <Enter> key to select "Enhanced"

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled." 6. Scroll down to "Exit". Select "Exit Saving Changes" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

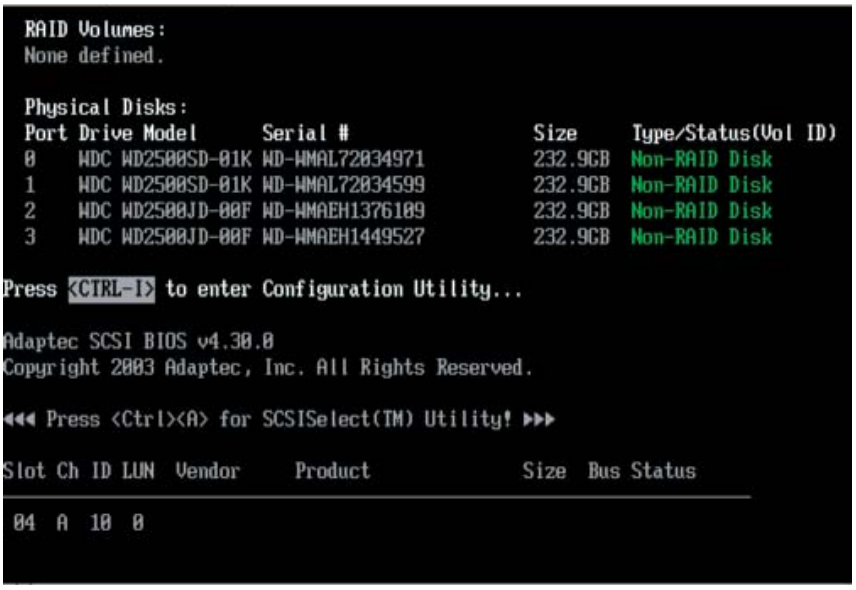
7. Once you've exited the BIOS Utility, the system will re-boot.

8. During the system boot-up, press the <Ctrl> and <I> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: Press <Ctrl> <I> for Intel RAID Configuration Utility.

Using the Intel ICH9R SATA RAID Utility Program

1. Creating, Deleting and Resetting RAID Volumes:

a. After the system exits from the BIOS Setup Utility, the system will automatically reboot. The following screen appears after Power-On Self Test.

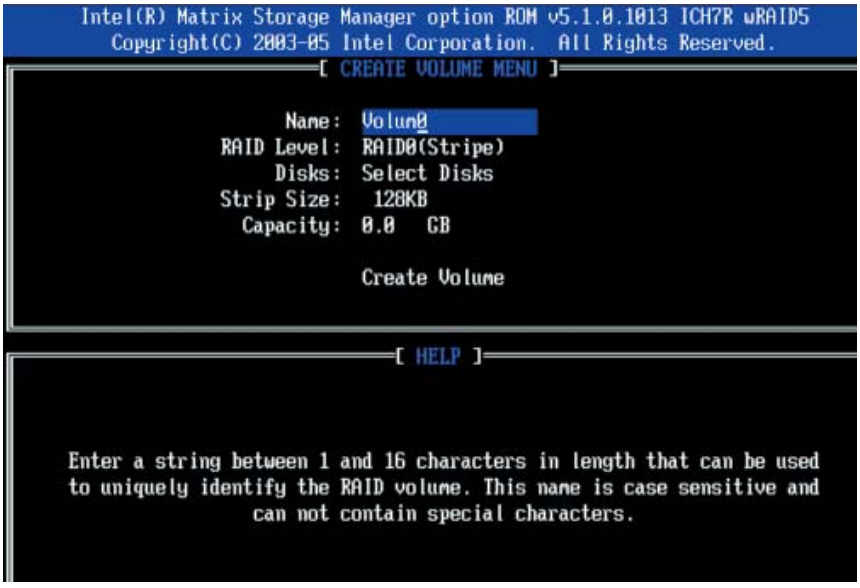

RAID Volumes:
None defined.
Physical Disks:
Port Drive Model Serial # Size Type/Status(Vol ID)
0 WDC WD2500SD-01K WD-WMAL72034971 232.9GB Non-RAID Disk
1 WDC WD2500SD-01K WD-WMAL72034599 232.9GB Non-RAID Disk
2 WDC WD2500JD-00F WD-WMAEH1376109 232.9GB Non-RAID Disk
3 WDC WD2500JD-00F WD-WMAEH1449527 232.9GB Non-RAID Disk
Press <CTRL-I> to enter Configuration Utility...
Adaptec SCSI BIOS v4.30.0
Copyright 2003 Adaptec, Inc. All Rights Reserved.
<<< Press <Ctrl><A> for SCSISelect(TM) Utility! >>>
Slot Ch ID LUN Vendor Product Size Bus Status
04 A 10 0

b. When you see the above screen, press the <Ctrl> and the <I> keys simultaneously to have the main menu of the SATA RAID Utility appear:

Note: All graphics and screen shots shown in the manual are for reference only. The screen shots shown in the manual do not imply Supernicro's endorsement or non-endorsement on any 3rd party's product. Your screens may or many not look exactly the same as the graphics shown in this manual.

Creating a RAID 0 Volume:

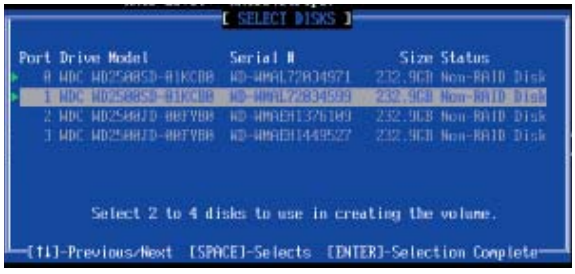
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volun0
RAID Level: RAID0(Stripe)
Disks: Select Disks
Strip Size: 128KB
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the RAID 0 set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select RAID 0 (Stripe) and hit <Enter>.

d. When the Disks item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See the note on Page C-3) displays:


[SELECT DISKS]
Port Drive Model Serial # Size Status
Select 2 to 4 disks to use in creating the volume.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete

e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 0 array, and hit <Enter>. **Note**: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.

g. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

h. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 1 Volume:

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:

Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volun1
RAID Level: RAID1(Mirror)
Disks: Select Disks
Strip Size: N/A
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the RAID 1 set and press the <Tab> key or the <Enter> key to go to the next field. (You can use the <Esc> key to select the previous menu.)

c. When RAID Level item is highlighted, press the <Up Arrow>, <Down Arrow> keys to select RAID 1 (Mirror) and hit <Enter>.

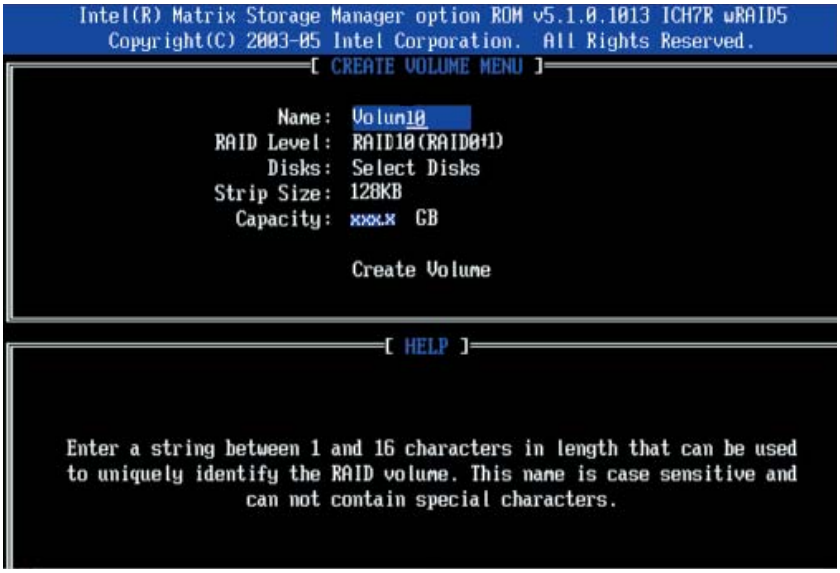
d. When the Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

e. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

f. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 10 (RAID 1+ RAID 0):

a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:


Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volun10
RAID Level: RAID10(RAID0+1)
Disks: Select Disks
Strip Size: 128KB
Capacity: xxx.x GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the RAID 10 set and press <Enter>.

c. When RAID Level item is highlighted, use the <Up Arrow>, <Down Arrow> keys to select RAID 10 (RAID1 + RAID0) and hit <Enter>.

d. When the Stripe Size is highlighted, use the <Up Arrow>, <Down Arrow> keys to select the stripe size from 4 KB to 128 KB for your RAID 10 and hit <Enter>. The default setting is 6 4KB. (Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size.)

e. When the RAID Volume Capacity item is highlighted, enter your RAID volume capacity and hit <Enter>. The default setting is the maximum capacity allowed.

f. Press <Enter> when the Create Volume item is highlighted. A warning message displays.

g. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Creating a RAID 5 Set (Parity):

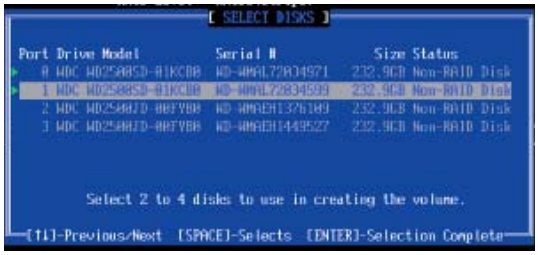
a. Select "Create RAID Volume" from the main menu and press the <Enter> key. The following screen will appear:

Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[CREATE VOLUME MENU]
Name: Volum5
RAID Level: RAID5(Parity)
Disks: Select Disks
Strip Size: 64 KB
Capacity: 0.0 GB
Create Volume
[HELP]
Enter a string between 1 and 16 characters in length that can be used to uniquely identify the RAID volume. This name is case sensitive and can not contain special characters.

b. Specify a name for the RAID 5 set and press <Enter>.

c. When the Raid Level is highlighted, use the <Up Arrow>, <Down Arrow> keys to select RAID 5 (Parity) and hit <Enter>.

d. When the Disk item is highlighted, press <Enter> to select the HDD to configure as RAID. The following pop-up screen (*See the note on Page C-3) displays:


[SELECT DISKS]
Port Drive Model Serial # Size Status
Select 2 to 4 disks to use in creating the volume.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete

e. Use the <Up Arrow>, <Down Arrow> keys to highlight a drive and press <Space> to select it. A triangle appears to confirm the selection of the drive.

f. Use the <Up Arrow>, <Down Arrow> keys to select the stripe size, ranging from 4 KB to 128 KB for the RAID 5 array, and hit <Enter>. (Note: For a server, please use a lower stripe size, and for a multimedia system, use a higher stripe size. The default stripe size is 128 KB.)

g. Enter your desired RAID volume capacity and press <Enter> when the capacity item is highlighted. The default setting is the maximum capacity allowed.

h. Press Enter when the Create Volume item is highlighted. A warning message displays.

i. When asked "Are you sure you want to create this volume (Y/N), press "Y" to create the RAID volume, or type "N" to go back to the Create Volume menu.

Deleting RAID Volume:

Warning: Be sure to back up your data before deleting a RAID set. You will lose all data on the disk drives when deleting a RAID set.)

a. From the main menu, select item2-Delete RAID Volume, and press <Enter>.

b. Use the <Up Arrow>, <Down Arrow> keys to select the RAID set you want to delete and press <Del>. A Warning message displays.

c. When asked "Are you sure you want to delete this volume (Y/N), press "Y" to delete the RAID volume, or type "N" to go back to the Delete Volume menu.

Resetting to Non-RAID and Resetting a RAID HDD

Warning: Be cautious when you reset a RAID volume HDD to non-RAID or Resetting a RAID HDD. Resetting a RAID volume HDD or Resetting a RAID HDD will reformat the HDD and delete all internal RAID structure on the drive.

a. From the main menu, select item3-Reset Disks to Non- RAID, and press <Enter>. The following screen will appear:

Intel(R) Matrix Storage Manager option ROM v5.1.0.1013 ICH7R wRAID5
Copyright(C) 2003-05 Intel Corporation. All Rights Reserved.
[MAIN MENU]
1. Create RAID Volume
[RESET RAID DATA]
Resetting RAID data will remove internal RAID structures
from the selected RAID disks. By removing these structures
the drive will revert back to a non-RAID disk.
WARNING: Resetting a disk causes all data on the disk to be lost
Port Drive Model Serial # Size Status
1 WDC WD2500SD-01KCB0 WD-WMAL72034599 232.9GB
Select the disks that should be reset.
[↑↓]-Previous/Next [SPACE]-Selects [ENTER]-Selection Complete
[↑↓]-Select [ESC]-Exit [ENTER]-Select Menu

b. Use the <Up Arrow>, <Down Arrow> keys to highlight the RAID set drive to reset and press <Space> to select.

c. Press <Enter> to reset the RAID set drive. A Warning message displays.

d. Press "Y" to reset the drive, or type "N" to go back to the main menu.

Exiting the Intel Matrix Storage Manager Utility:

a. From the main menu, select item4-Exit, and press <Enter>. A warning message will appear.

b. Press "Y" to reset the drive, or type "N" to go back to the main menu.

C-2 Installing Windows XP/2000/2003 for RAID Systems

Installing a New Operating System-the Windows XP/2000/2003 OS

a. Insert Microsoft's Windows XP/2000/2003 Setup CD in the CD Driver, and the system will start booting up from CD.

b. Press the <F6> key when the message-" Press F6 if you need to install a third party SCSI or RAID driver" displays.

c. When the Windows XP/2000/2003 Setup screen appears, press "S" to specify additional device(s).

d. Insert the driver diskette-"Intel AA RAID XP/2000/2003 Driver for ICH9R into Drive A: and press the <Enter> key.

e. Select the Intel(R)82801GR/GH *SATA RAID Controller* from the list indicated in the XP/2000/2003 Setup Screen, and press the <Enter> key.

f. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

g. From the Windows XP/2000/2003 Setup screen, press the <Enter> key. The XP/2000/2003 Setup will automatically load all device files and then, continue the Windows XP/2000/2003 installation.

h. After the Windows XP/2000/2003 Installation is completed, the system will automatically reboot.

i. Insert the Supermicro Setup CD that came with the package into the CD Drive during system reboot, and the main screen will appear.

Note: the current version of the ICH9R SATA RAID Utility can only support the Windows XP/2000/2003 Operating System.

Appendix D

Adaptec HostRAID Setup Guidelines

After all the hardware has been installed, you must first configure the Adaptec Embedded Serial ATA RAID before you install the Windows operating system. The necessary drivers are all included on the Supermicro bootable CDs that came packaged with your motherboard.

Note : The following section provides information on the Adaptec SATA RAID Driver based on the Intel Enterprise South Bridge 2 (ICH9R) Controller.

D-1 Introduction to Adaptec SATA RAID

Serial ATA (SATA)

Serial ATA(SATA) is a physical storage interface. It uses a single cable with a minimum of four wires to create a point-to-point connection between devices. It is a serial link which supports SATA Transfer rates up to 3.0 Gbps. Because the serial cables used in SATA are thinner than the traditional cables used in Parallel ATA(PATA), SATA systems have better airflow and can be installed in smaller chassis than Parallel ATA. In addition, the cables used in PATA can only extend to 40cm long, while Serial ATA cables can extend up to one meter. Overall, Serial ATA provides better functionality than Parallel ATA.

Introduction to the Intel ICH9R Controller Hub

Located in the South Bridge of the Intel 3210 Chipset, the ICH9R Controller Hub provides the I/O subsystem with access to the rest of the system. It supports the Adaptec's firmware, which support up to four Serial ATA drives, up to two RAID volumes and up to six drives in RAID Configurations.

*** Adaptec's SATA HostRAID Controller Firmware supports:**	
Drives supported	Four
Number of RAID Volumes supported	Two
Total Drives in RAID Configurations	Four
Examples of Valid RAID Configurations:	
Two drives of RAID 1 + two drives of RAID 0	
Two drives of RAID 1 + two drives of RAID 1	
Three drives of RAID 0	
Four drives of RAID 0	
Examples of Invalid RAID Configurations:	
Three drives of RAID 0 + two drives of RAID 1	
(***Note**: this table is applicable to Adaptec's HostRAID Controller Firmware only.)	

To configure the Adaptec SATA RAID for Operating Systems that support RAID functions(--Windows, Red Hat & SuSe, Linux)

1. Press the <Del> key during system bootup to enter the BIOS Setup Utility.

Note: If it is the first time powering on the system, we recommend you load the Optimized Default Settings. If you have already done so, please skip to Step 3.

2. Use the arrow keys to select the "Exit" Settings. Once in the "Exit" settings, Scroll down to select "Load Optimized Default Settings" and press the <Enter> key. Select "OK" to confirm the selection. Press the <Enter> key to load the default settings for the BIOS.

3. Use the arrow keys to select the "Main" section in BIOS.

4. Scroll down to "SATA Control Mode" and press the <Enter> key to select "Enhanced"

5. Scroll down to "SATA RAID Enabled" and press <Enter>. Then, select "Enabled."

6. Scroll down to "ICH RAID Codebase" and select "Adaptec". Then press <Enter>. (For ICH RAID Codebase: Change the setting from Intel to Adaptec.)

7. Scroll down to "Exit". Select "Exit Saving Changes" from the "Exit" menu. Press the <Enter> key to save the changes and exit the BIOS.

8. Once you've exited the BIOS Utility, the system will re-boot.

9. During the system boot-up, press the <Ctrl> and <A> keys simultaneously to run the Intel RAID Configuration Utility when prompted by the following message: *Press <Ctrl> <A> for* Intel *RAID Configuration Utility*.

The Adaptec Embedded Serial ATA with HostRAID Controller Driver

The Adaptec Embedded Serial ATA RAID Controller adds SATA/RAID functionality and performance enhancements to a motherboard. RAID striping (RAID 0) allows data to be written across multiple drives, greatly improving hard disk I/O performance. RAID mirroring (RAID 1) allows data to be simultaneously written to two drives, improving data security even if a single hard disk fails. A Stripe of Mirrors (RAID 10) provides multiple RAID 1 mirrors and a RAID 0 stripe, maximizing data security and system efficiency. By incorporating the Adaptec Embedded Serial ATA into the motherboard design, Supermicro's X7SB4/X7SBE offers the user the benefits of SATARAID without the high costs associated with hardware RAID applications.

Using the Adaptec RAID Configuration Utility (ARC)

The Adaptec RAID Configuration Utility, an embedded BIOS Utility, includes the following:

Array Configuration Utility: Use this utility to create, configure and manage arrays.

Disk Utilities: Use this option to format or verify disks.

To run the Adaptec RAID Configuration Utility, you will need to do the following:

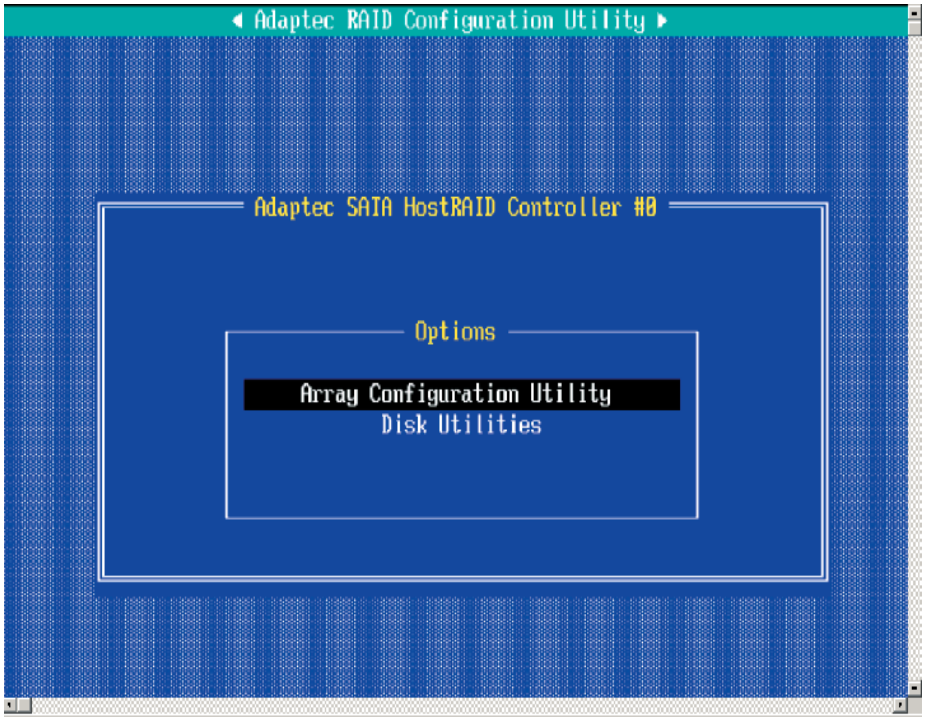
1. Enable RAID functions in the system BIOS. (Refer to Chapter 4 for System BIOS Configurations).

2. Press the <Ctrl> and <A> keys simultaneously when prompted to do so during system boot. (Refer to the previous page for detailed instructions.)

A. Using the Array Configuration Utility (ACU)

When you press <Ctrl> and <A> keys simultaneously at the prompt during system bootup, the main menu will appear.

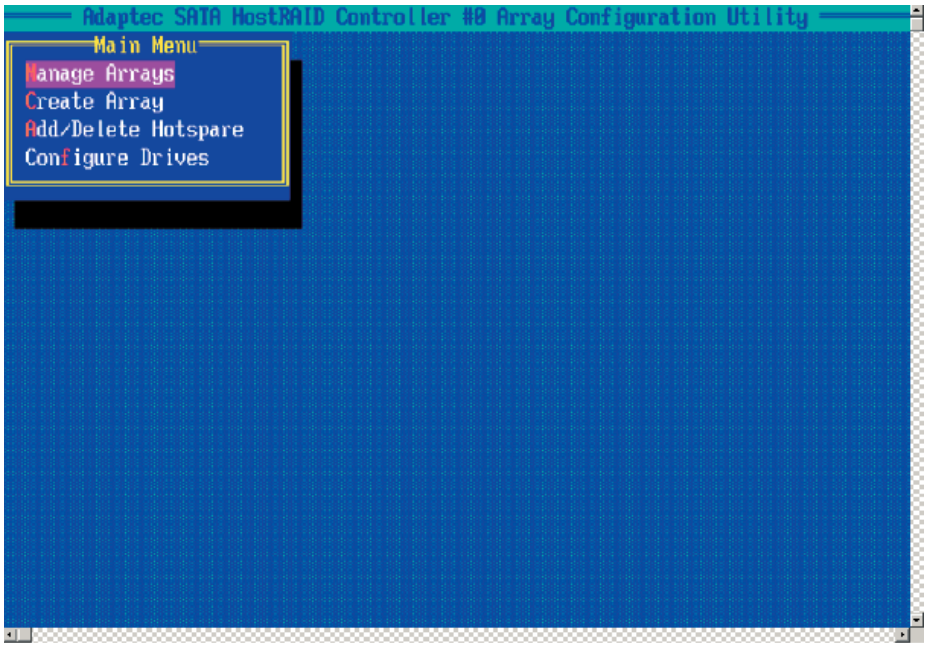
Note: To select an option, use the arrow keys to highlight the item and then press the <Enter> key to select it. To return to the previous menu, press the <ESC> key. Press the <Insert> key to select a drive. When a drive is highlighted (selected), press the <Delete> key to de-select it.



Managing Arrays

Select this option to view array properties, and configure array settings.

To select this option, using the arrow keys and the <enter> key, select "Managing Arrays" from the main menu as shown above.



Configuring Disk Drives

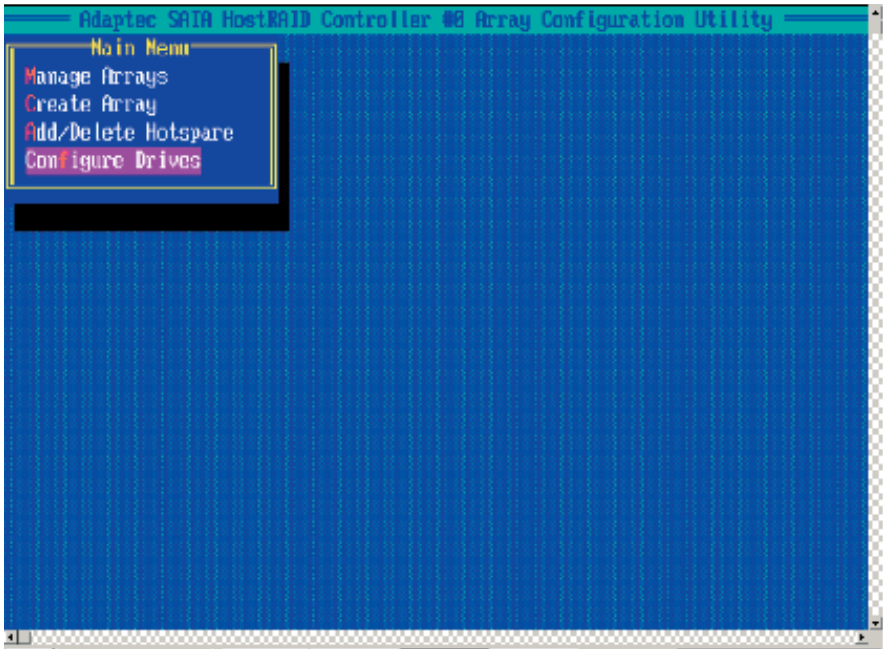
You may need to configure a disk drive before you can use it.

Caution: Configuring a disk may overwrite the partition table on the disk and may make any data on the disk inaccessible. If the drive is used in an array, you may not be able to use the array again.

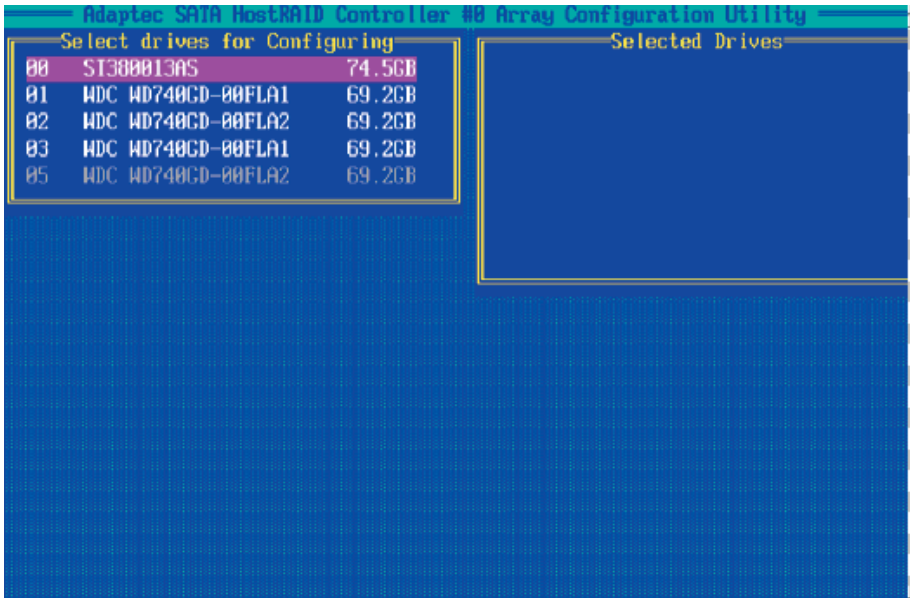
Do not configure a disk that is part of a boot array. To determine which disks are associated with a particular array, please refer to Viewing Array Properties.

To configure a disk drive:

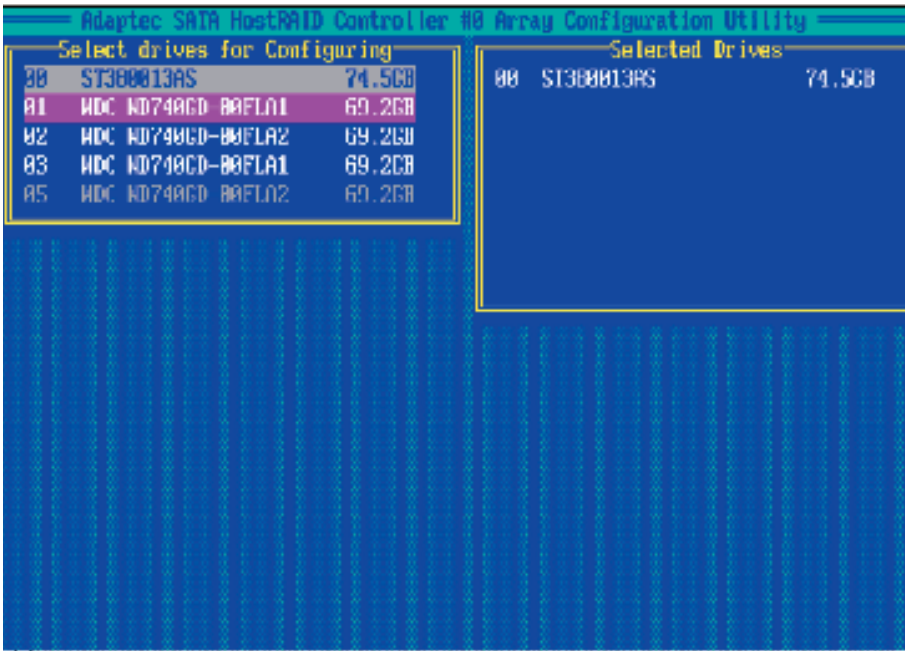
1. From the main menu (shown on Page D-4), select Configure Drives and hit <Enter> (as shown below.)



2. From the "Select Drives for Configuring" List (shown below,) select the drives you want to configure and press <Insert>.

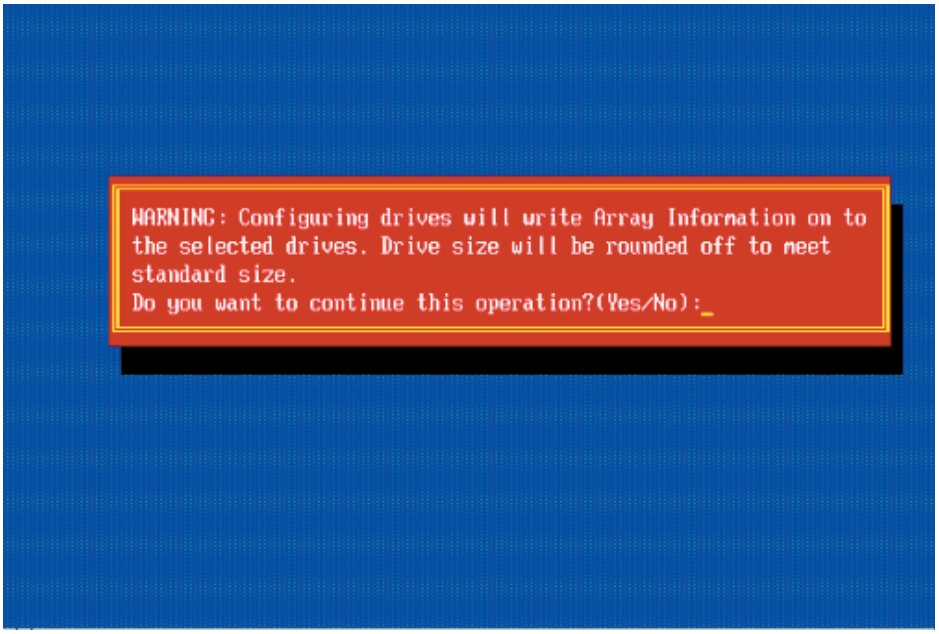

Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives for Configuring
00 ST380013AS 74.5GB
01 WDC WD740GD-00FLA1 69.2GB
02 WDC WD740GD-00FLA2 69.2GB
03 WDC WD740GD-00FLA1 69.2GB
05 WDC WD740GD-00FLA2 69.2GB
Selected Drives

3. The drive you've selected will appear in the "Selected Drives Dialog Box" on the right (as shown below.) Repeat the same steps until all drives that you want to configure appear in the selected drives box.


Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives for Configuring
00 ST380013AS 74.5GB
01 WDC WD740GD-00FLA1 69.2GB
02 WDC WD740GD-00FLA2 69.2GB
03 WDC WD740GD-00FLA1 69.2GB
05 WDC WD740GD-00FLA2 69.2GB
Selected Drives
00 ST380013AS 74.5GB

4. Once both drives display in the selected drive box, press <Enter.>

5. Read the warning message as shown in the screen below.


WARNING: Configuring drives will write Array Information on to the selected drives. Drive size will be rounded off to meet standard size.
Do you want to continue this operation?(Yes/No):_

6. Make sure that you have selected the correct disk drives to configure. If correct, type Y to continue.

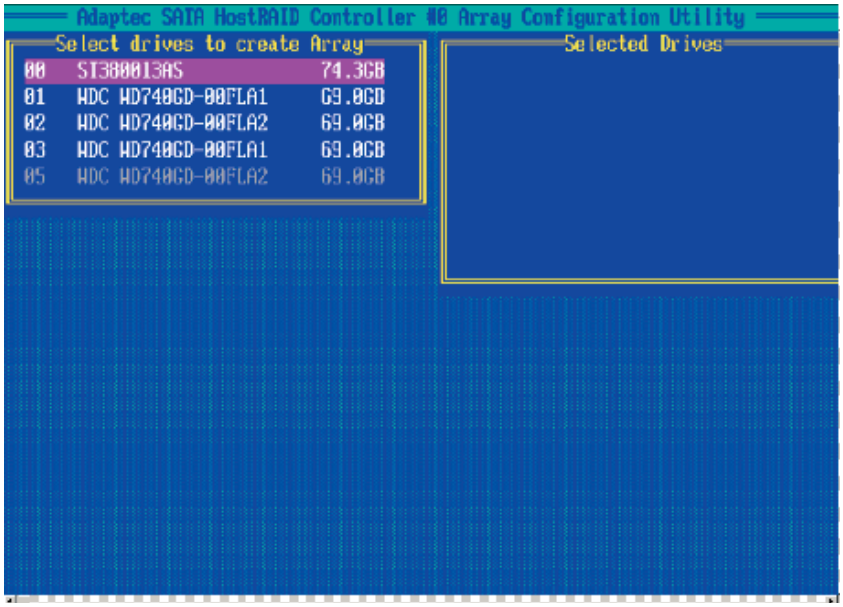
Creating Arrays

Before you create arrays, make sure that the disks for the array are connected and installed in your system. Note that disks with no usable space, or disks that are un-initialized or not formatted are shown in gray and cannot be used. **Note**: It is recommended that you configure devices before you create arrays.

To create an array:

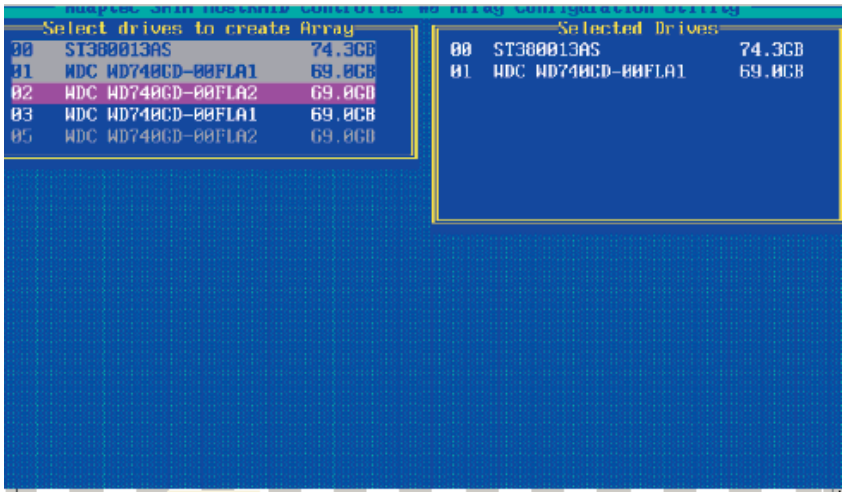
1. From the main menu (shown on page D-4), select Create Array.

2. Select the disks for the new array and press Insert (as the screen shown below). **Note**: To de-select any disk, highlight the disk and press Delete.


Adaptec SATA HostRAID Controller #0 Array Configuration Utility
Select drives to create Array
00 ST380013AS 74.3GB
01 WDC WD740GD-00FLA1 69.0GB
02 WDC WD740GD-00FLA2 69.0GB
03 WDC WD740GD-00FLA1 69.0GB
05 WDC WD740GD-00FLA2 69.0GB
Selected Drives

3. The arrays you have selected will appear on the Selected Drives dialog box on the right (as shown below.)

4 Press Enter when both disks for the new array are selected. The Array Properties menu displays.



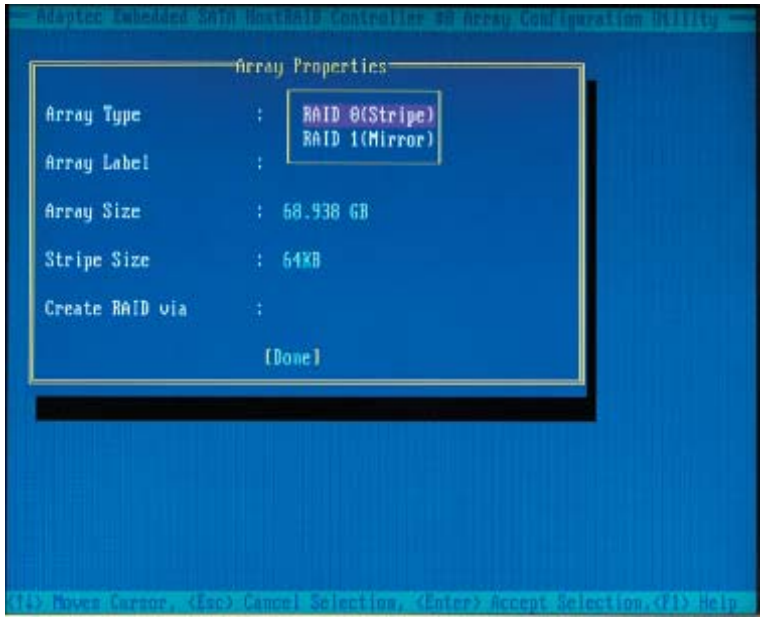
Assigning Array Properties

Once a new array is completed, you can assign properties to the array.

Caution: Once the array is created and its properties are assigned, and you cannot change the array properties using this utility.

To assign properties to the new array:

1. In the Array Properties menu (as shown in the screen below), select an array type and press Enter. Only the available array types will be displayed on the screen. (RAID 0 or RAID 1 requires two drives.)



2. Under the item "Arrays Label", type in a label and press <Enter>. **Note**: The label shall not be more than 15 characters.)

3. For RAID 0, select the desired stripe size. Note: Available stripe sizes are 16, 32, and 64 KB. 64K is default. Please do not change the default setting.)

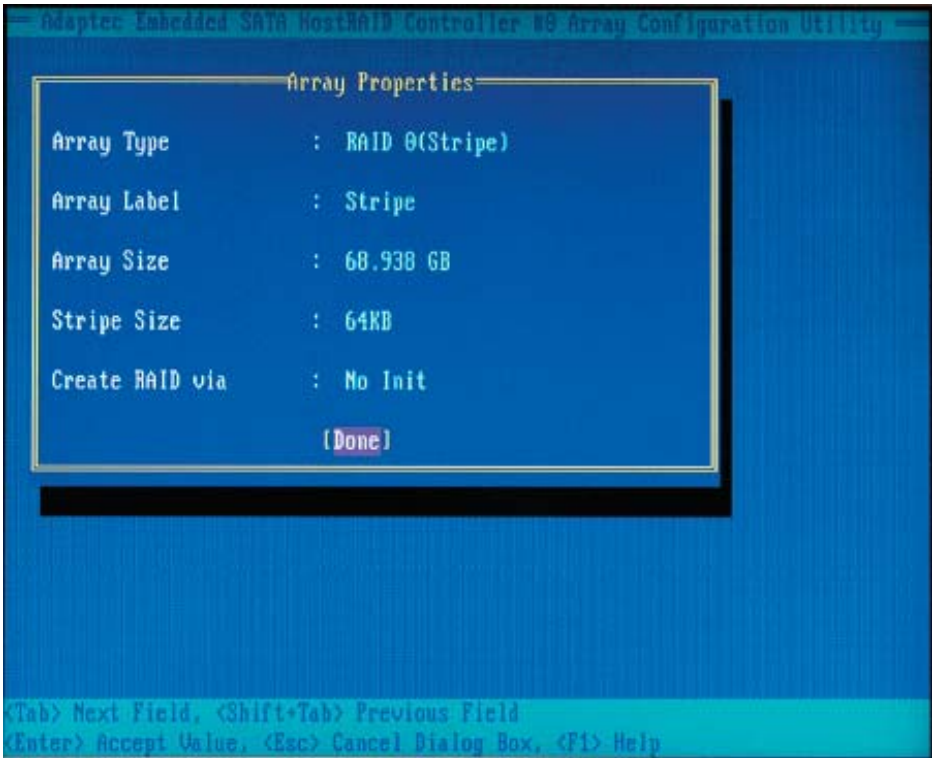
4. The item: "Create RAID via" allows you to select between the different ways of creating methods for RAID 0 and RAID 1.

The following table gives examples of when each is appropriate.

Raid Level	Create Via	When Appropriate
RAID 0	Quick Init	Creating a RAID 0 on new drives
RAID 0	Migrate*	Creating a RAID 0 from one new drive and one drive with data you wish to preserve
RAID 1	Build*	Any time you wish to create a RAID 1, but especially if you have data on one drive that you wish to preserve
RAID 1, RAID 10	Clear	Creating a RAID 1 or RAID 10 on new drives, or when you want to ensure that the array contains no data after creation.
RAID 1, RAID 10	Quick Init	Fastest way to create a RAID 1 or RAID 10 Appropriate when using new drives

Note: If you select Migrate for RAID 0, or Build for RAID 1, you will be asked to select the source drive. The contents of the source drive will be preserved. However, the data on the new drive will be lost.

5. When you are finished, press <Done> (as the screen shown below).


Adaptec Embedded SATA HostRAID Controller #0 Array Configuration Utility
Array Properties
Array Type : RAID 0(Stripe)
Array Label : Stripe
Array Size : 68.938 GB
Stripe Size : 64KB
Create RAID via : No Init
[Done]
<Tab> Next Field, <Shift+Tab> Previous Field
<Enter> Accept Value, <Esc> Cancel Dialog Box, <F1> Help

Notes:

1. Before adding a new drive to an array, be sure to back up any data stored on the new drive; otherwise, all data will be lost.

2. If you stop the Build or Clear process on a RAID 1, you can restart it by pressing <Ctrl> and <R>.

3. If you've used the Quick Init option to create a RAID1, it may return some data mis-comparison when you run a consistency check at a later time. This is normal.

4. The Adaptec Host RAID allows you to use drives of different sizes in a RAID. However, you can only select a smaller drive as the source or first drive during a build operation.

5. When migrating from single volume to RAID 0, migrating from a larger drive to a smaller drive is allowed. However, the destination drive must be at least half the capacity of the source drive.

6. It is not recommended that you migrate or build an array on Windows dynamic disks (volumes) because it will result in data loss.

Warning: Do not interrupt the process when you create a RAID 0 using the Migrate option. If you do, you will not be able to restart the system, or to recover the data that was on the source drive.

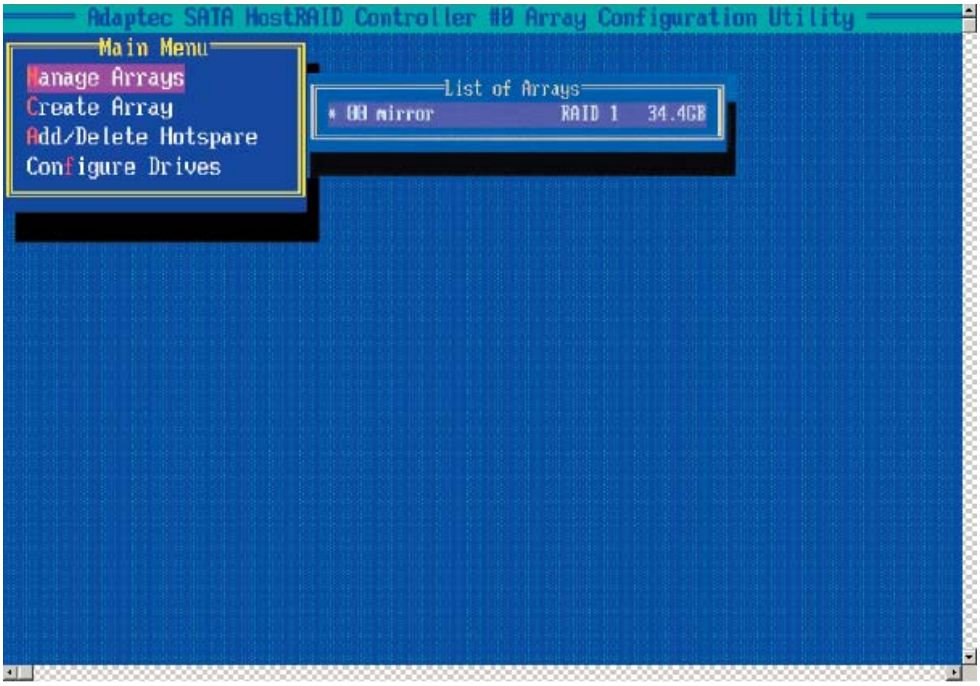
Adding a Bootable Array

To make an array bootable:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the array you want to make bootable, and press <Ctrl> and <B>.

3. Enter Y to create a bootable array when the following message is displayed: "This will make all other existing bootable array non-bootable. Do you want to make this array bootable? (Yes/No):" Then, a bootable array will be created. An asterisk () will appear next to the bootable array (as shown in the picture below:)



Deleting a Bootable Array

To delete a bootable array:

1. From the Main menu, select Manage Arrays.

2. From the List of Arrays, select the bootable array you want to delete, and press <Ctrl> and <B>. Note: a bootable array is the array marked with an asterisk (as shown in the picture above.)

3. When the following message is displayed: "The array is already marked bootable. Do you want to make this array as not bootable? (Yes/No)," Enter Y to delete a bootable array. The bootable array will be deleted and the asterisk will disappear.

Note: Do not use the delete key to delete the bootable array.

Adding/Deleting Hotspares

To add a Hotspare:

Note: In order to rebuild a RAID (RAID 0 or RAID 1), you would need to add a new HDD as a hotspare.

1. From the main menu (shown on Page D-4), select Add/Delete Hotspares.

2. Use the up and down arrow keys to highlight and select the disk you want to designate as a hotspare, and press <Insert>, and then, press <Enter>.

3. Press Yes when the following prompt is displayed:

"Do you want to create spare?" (Yes/No?)

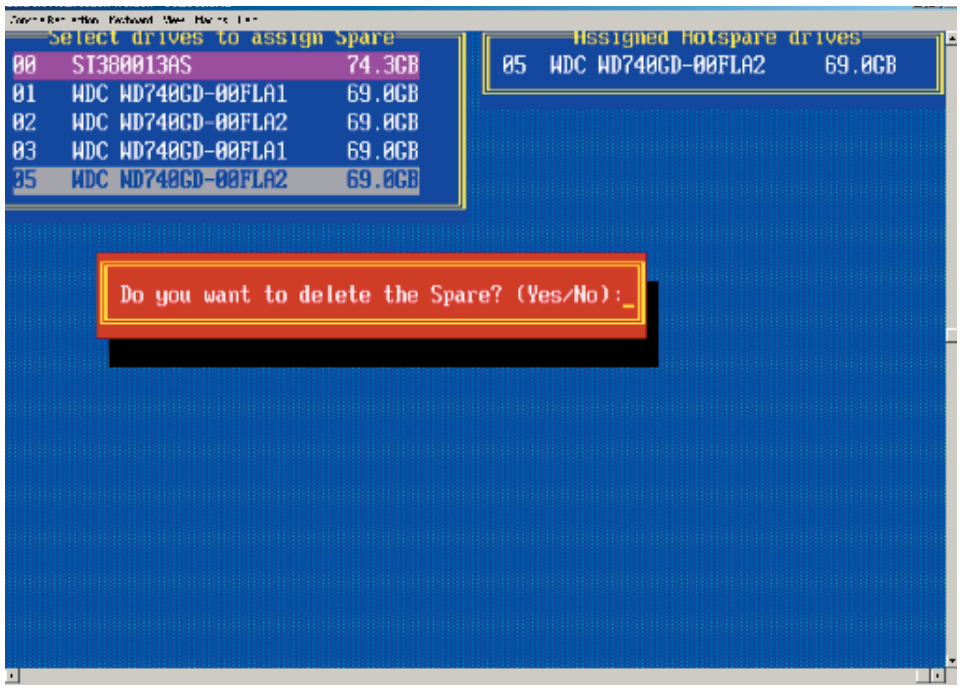
The spare you have selected will appear in the Selected drives Menu.

To delete a Hotspare:

1. From the main menu (shown on Page D-4), select Add/Delete Hotspares.

2. Use the up and down arrow keys to highlight and select the Hotspare you want to delete, and press <delete>, and then, press <Enter>.

3. When the following warning is displayed: "Do you want to delete the hot spare?" (Yes/No?), press Yes to delete the hotspare you have selected.


Select drives to assign Spare
00 ST380013AS 74.3GB
01 WDC WD740GD-00FLA1 69.0GB
02 WDC WD740GD-00FLA2 69.0GB
03 WDC WD740GD-00FLA1 69.0GB
05 WDC WD740GD-00FLA2 69.0GB
Assigned Hotspare drives
05 WDC WD740GD-00FLA2 69.0GB
Do you want to delete the Spare? (Yes/No):_

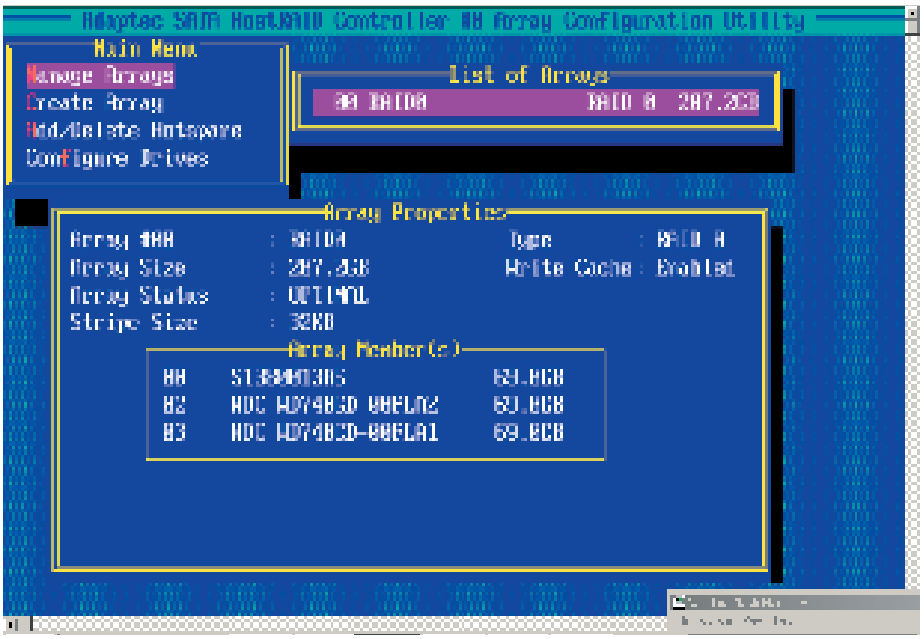
Viewing Array Properties

To view the properties of an existing array:

1. From the main menu, select Manage Arrays and hit <Enter> (as shown on the previous page.)

2. From the List of Arrays dialog box (shown below), select the array you want to view and press Enter.

The Array Properties dialog box appears (as shown below), showing detailed information on the array. The physical disks associated with the array are displayed here.



3. Press Esc to return to the previous menu.

Rebuilding Arrays

Note 1: Rebuilding applies to Fault Tolerant array (RAID 1) only.

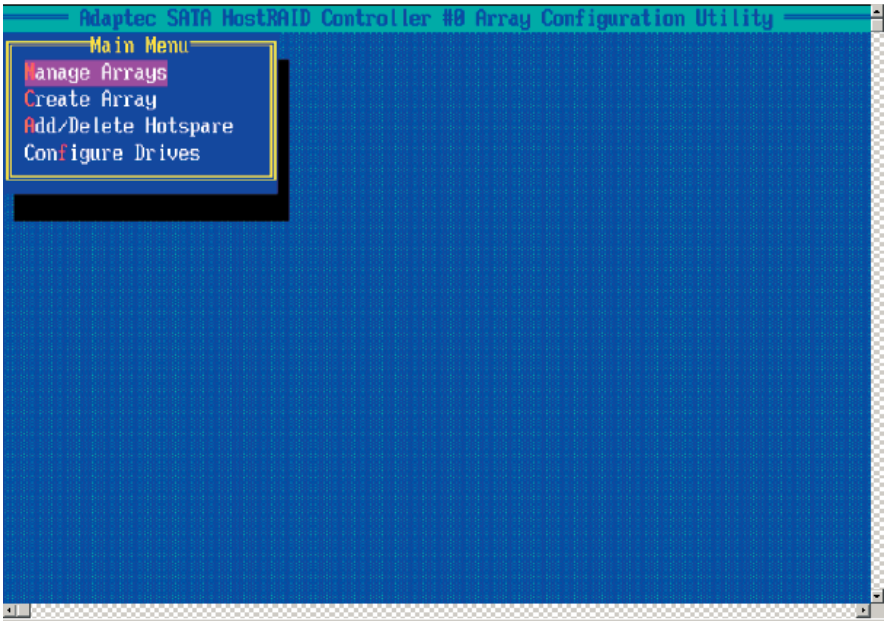
If an array Build process is interrupted or when one critical member is missing, you must perform a Rebuild to restore its functionality. For a critical array rebuild operation, the optimal drive is the source drive.

Note 2: If no spare array exists and a hard disk drive fails, you need to create a spare before you can rebuild an array.

To Rebuild an array:

1 From the Main Menu, select Manage Arrays (as shown in the screen below). From the List of Arrays, select the array you want to rebuild.

2 Press <Ctrl> and <R> to rebuild.



Deleting Arrays

Warning!! Back up the data on an array before you delete it to prevent data loss Deleted arrays cannot be restored.

To delete an existing array:

1. From the main menu (shown on Page D-4), select Manage Arrays.

2. Select the array you wish to delete and press <delete>.

3. In the Array Properties dialog box, select Delete and press <Enter>. The following prompt is displayed:

Warning!! Deleting the array will render array unusable. Do you want to delete the array? (Yes/No):

RAID 1 only—the following prompt is also displayed:

Deleting the partition will result in data loss! Do you also want to delete the partition? (Yes/No):

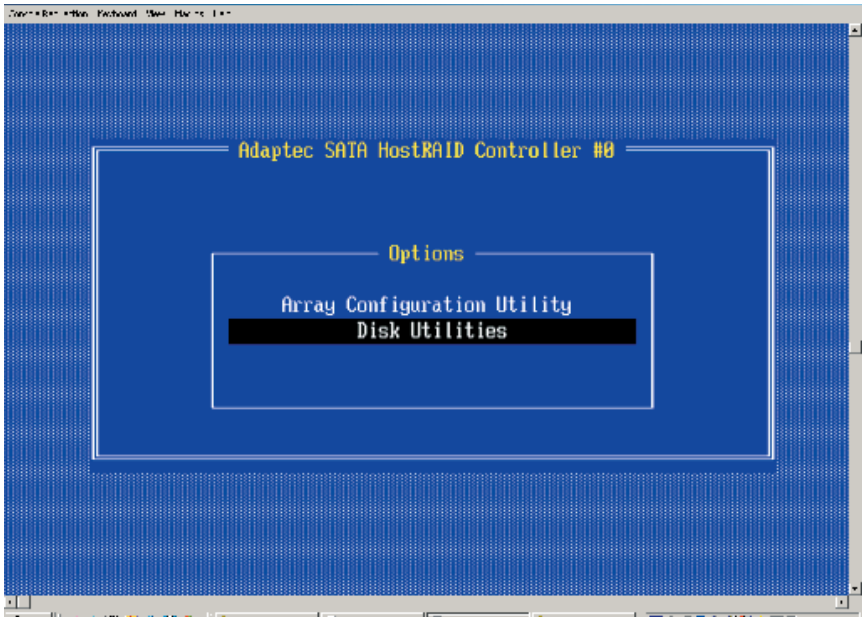
4. Press Yes to delete the array and partition or No to return to the previous menu.

5. Press Esc to return to the previous menu.

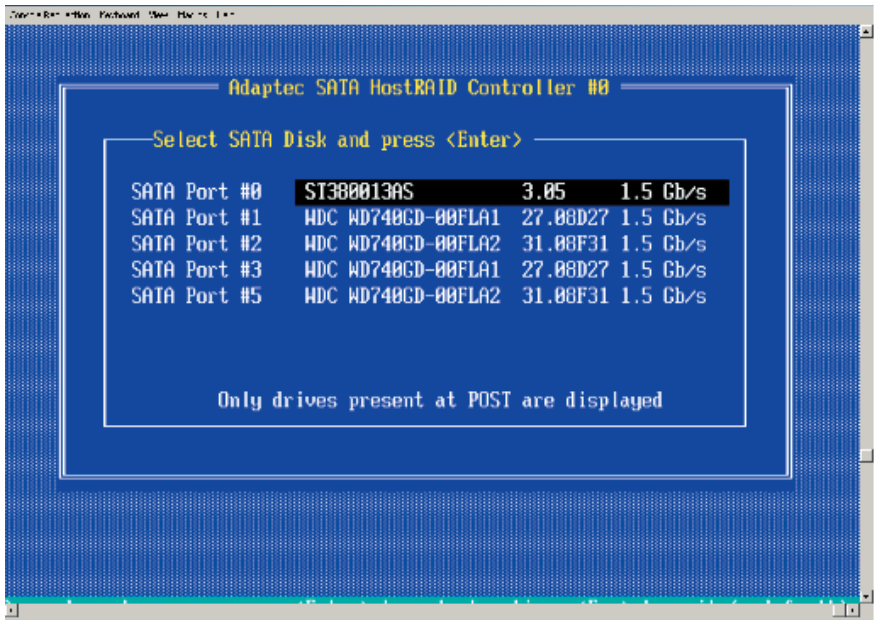
Using the Disk Utilities

The Disk Utilities enable you to format or verify the media of your Serial ATA hard disks.

To access the disk utilities:



1. From the Adaptec RAID Configuration Utility Menu, select Disk Utilities (as shown above) and press <Enter>. The following screen appears.

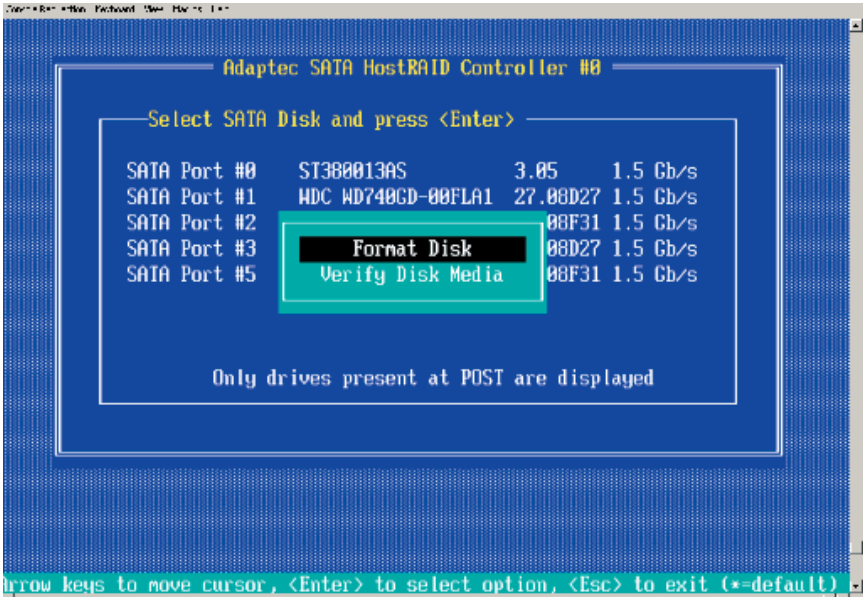

Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.00D27 1.5 Gb/s
SATA Port #2 WDC WD740GD-00FLA2 31.00F31 1.5 Gb/s
SATA Port #3 WDC WD740GD-00FLA1 27.00D27 1.5 Gb/s
SATA Port #5 WDC WD740GD-00FLA2 31.00F31 1.5 Gb/s
Only drives present at POST are displayed

2. Select the desired disk and press <Enter>. The following screen appears:

To format a disk:

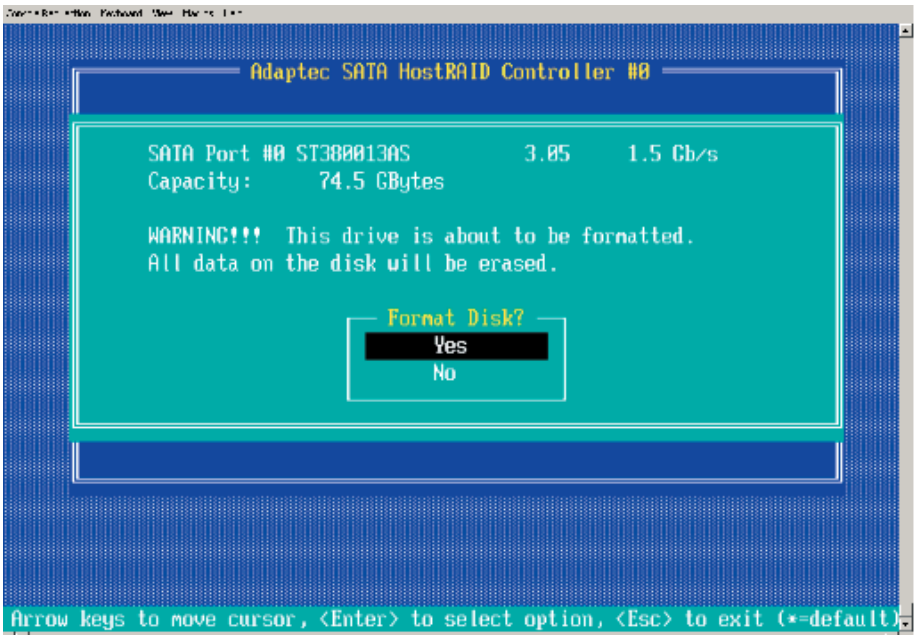
Note: The operation of Formatting Disk allows you to perform a low-level formatting of a hard drive by writing zeros to the entire disk. Serial ATA drives are low-level formatted at the factory and do not need to be low-level formatted again.

3. When the screen shown below displays, select Format Disk and press <Enter>. The following screen appears:

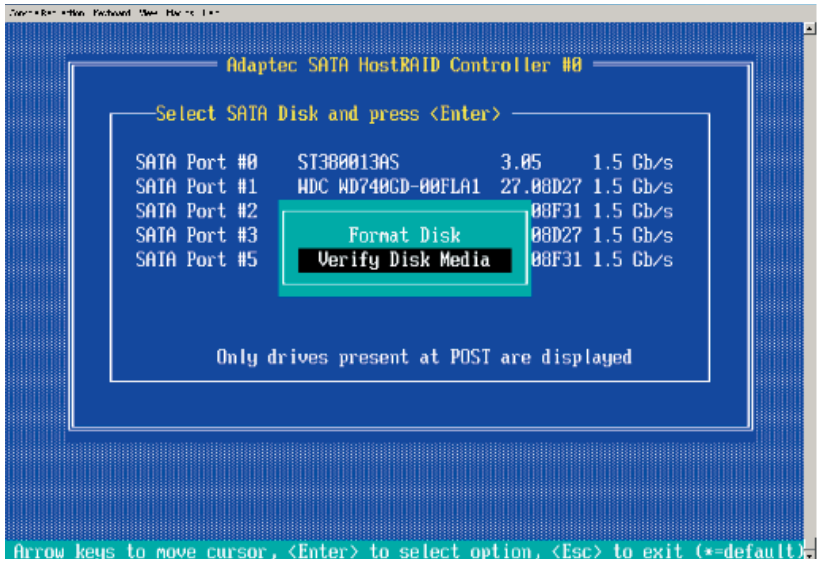

Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.08D27 1.5 Gb/s
SATA Port #2 08F31 1.5 Gb/s
SATA Port #3 08D27 1.5 Gb/s
SATA Port #5 08F31 1.5 Gb/s
Format Disk
Verify Disk Media
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

4. Read the warning message when it appears in the screen as shown below. To continue with disk formatting, select Yes and hit <Enter>. Otherwise, select No and press <Enter>.

Caution: Formatting a disk destroys all data on the drive. Be sure to back up your data before formatting a disk.

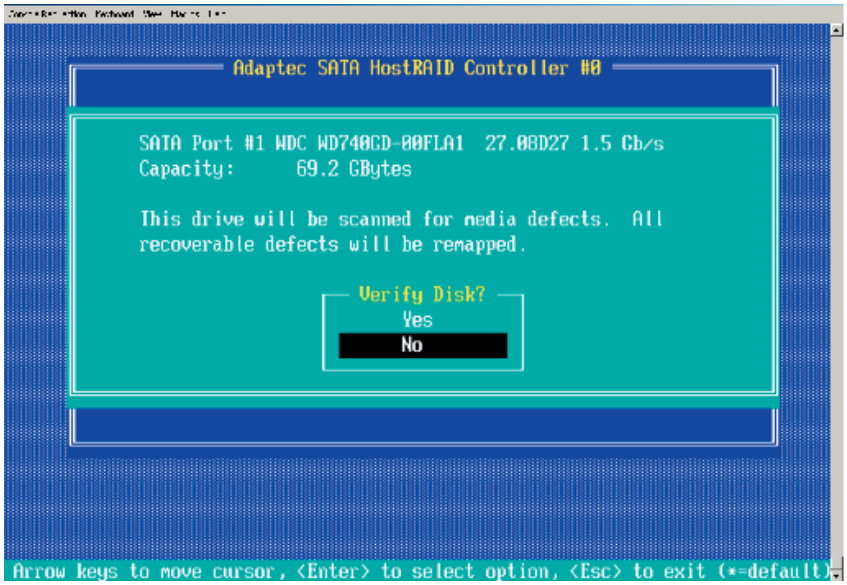

Adaptec SATA HostRAID Controller #0
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
Capacity: 74.5 GBytes
WARNING!!! This drive is about to be formatted.
All data on the disk will be erased.
Format Disk?
Yes
No
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

To verify disk media:


Adaptec SATA HostRAID Controller #0
Select SATA Disk and press <Enter>
SATA Port #0 ST380013AS 3.05 1.5 Gb/s
SATA Port #1 WDC WD740GD-00FLA1 27.08D27 1.5 Gb/s
SATA Port #2 08F31 1.5 Gb/s
SATA Port #3 08D27 1.5 Gb/s
SATA Port #5 08F31 1.5 Gb/s
Format Disk
Verify Disk Media
Only drives present at POST are displayed
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

3. When the screen shown above displays, select Verify Disk Media and press <Enter>.

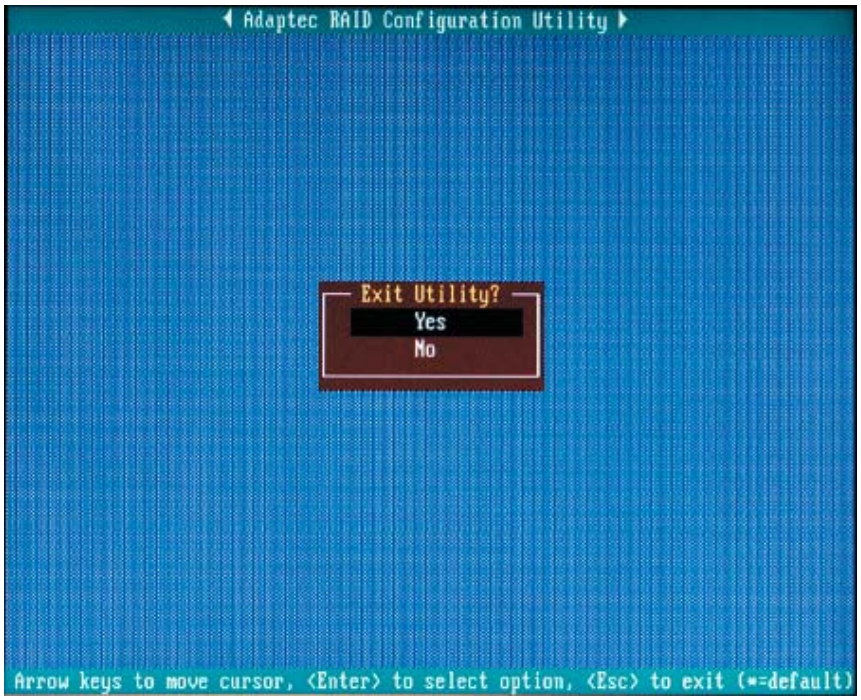
4. A message will display, indicating that the selected drive will be scanned for media defects. Select Yes and hit <Enter> to proceed with disk verifying; otherwise, select No and hit <Enter>.


Adaptec SATA HostRAID Controller #0
SATA Port #1 WDC WD740GD-00FLA1 27.08D27 1.5 Gb/s
Capacity: 69.2 GBytes
This drive will be scanned for media defects. All recoverable defects will be remapped.
Verify Disk?
Yes
No
Arrow keys to move cursor, <Enter> to select option, <Esc> to exit (*=default)

To Exit Adaptec RAID Configuration Utility

1. Once you have completed RAID array configurations, press ESC to exit. The following screen will appear.

2. Press Yes to exit the Utility.



D-2 Installing the Intel ICH9R Driver and the OS

a. Insert Supermicro's bootable CD that came with the package into the CD Drive during the system reboot, and the screen: "Supermicro Driver Diskette Maker" will appear.

b. Choose from the list the item: "Intel ICH9R Driver by 3rd Party (Adaptec)" and press <Enter>.

c. From the next screen displayed, choose the OS driver you want to install and press <Enter>.

d. Insert a formatted diskette into drive A: and press <Enter> as prompted.

e. Exit the program after the process is completed. Then, reboot the system.

f. Insert the Microsoft Windows OS Setup CD in the CD Driver, and the system will start to boot up from CD.

g. Press the <F6> key when the message-"Press F6 if you need to install a third party SCSI or RAID driver" displays.

h. When the Windows OS Setup screen appears, press "S" to specify additional device(s).

i. Insert the driver diskette-"Adaptec Embedded Serial ATA Raid Controller Driver" into Drive A: and press the <Enter> key.

j. Choose the Adaptec Embedded Host Serial ATA Raid Controller from the list indicated in the Windows OS Setup Screen, and press the <Enter> key.

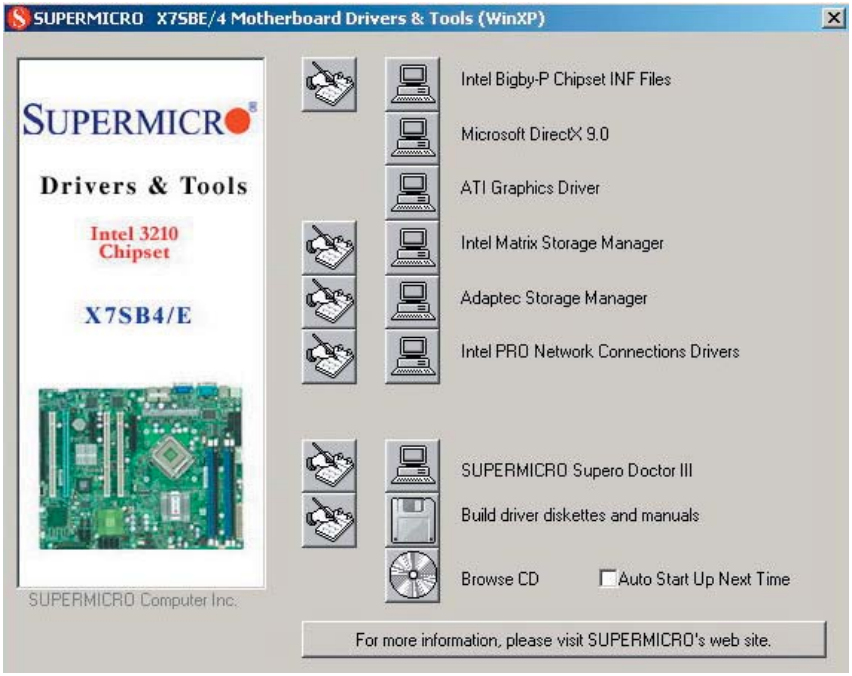
k. Press the <Enter> key to continue the installation process. (If you need to specify any additional devices to be installed, do it at this time.) Once all devices are specified, press the <Enter> key to continue with the installation.

l. From the Windows OS Setup screen, press <Enter>. The OS Setup will automatically load all device files, and, then, continue with the Windows OS installation.

m. After the Windows OS Installation is completed, the system will automatically reboot.

D-3 Installing Additional Drivers

After you've installed the Windows Operating System, a screen as shown below will appear. You are ready to install software programs and drivers that have not yet been installed. To install these software programs and drivers, click the icons to the right of these items.



Driver/Tool Installation Display Screen

Note: Click the icons showing a hand writing on the paper to view the readme files for each item. Click a computer icon to the right of an item to install an item (from top to the bottom) one at a time. **After installing each item, you must re-boot the system before proceeding with the next item on the list.** The bottom icon with a CD on it allows you to view the entire contents of the CD.

D-4 Configuring Supero Doctor III

The Supero Doctor III program is a Web-base management tool that supports remote management capability. It includes Remote and Local Management tools. The local management is called the SD III Client. The Supero Doctor III program included on the CDROM that came with your motherboard allows you to monitor the environment and operations of your system. Supero Doctor III displays crucial system information such as CPU temperature, system voltages and fan status. See the Figure below for a display of the Supero Doctor III interface.

Note: The default user name and password are ADMIN.

Note: In the Windows OS environment, the Supero Doctor III settings take precedence over the BIOS settings. When first installed, Supero Doctor III adopts the temperature threshold settings previously set in the BIOS. Any subsequent changes to these thresholds must be made within Supero Doctor, since the SD III settings override the BIOS settings. For the Windows OS to adopt the BIOS temperature threshold settings, please change the SDIII settings to be the same as those set in the BIOS.

Supero Doctor III Interface Display Screen-I (Health Information)

Supero Doctor III Interface Display Screen-II (Remote Control)

File Edit View Favorites Tools Help
Super Doctor III
Remote Management
SUPERMICRO
Remote Control
Graceful Power control
Open Console
Power Control
Enter
Graceful power control
Supero Doctor III allows a user to inform the OS to reboot or shut down within a specified time (the default is 30 seconds). Before the system reboots or shuts down, it's allowed to cancel the action.
Requirements
Keep Supero SD3Service Daemon running at all times on this system.
Provide TCP/IP connectivity.
Power control

Note: SD III Software Revision 1.0 can be downloaded from our Web site at: ftp://ftp.supermicro.com/utility/Supero_Doctor_III/. You can also download SDIII User's Guide at: http://www.supermicro.com/PRODUCT/Manuals/SDIII/User-Guide.pdf. For Linux, we will still recommend that you use Supero Doctor II.

Notes

Appendix E

System Specifications

Processors
Single Intel Xeon 3200/3000 Series LGA775 processors at system bus speeds of 1333, 1066 and 800 MHz

Note: Please refer to the motherboard specifications pages on our web site for updates on supported processors.

Chipset
Intel 3210/ICH9R chipset

BIOS
16 Mb Phoenix® Flash ROM

Memory Capacity
Four 240-pin DIMM slots that can support up to 8 GB of unbuffered ECC DDR2-800/667 SDRAM

Note: See the memory section in Chapter 5 for details.

SCSI Controller (5025M-4)
Adaptec AIC-7902 for single channnel, Ultra320 onboard SCSI

SATA Controller
On-chip (ICH9R) 3 Gb/s Intel SATA controller

SCSI/SATA Drive Bays
Six (6) drive bays to house six standard SCSI/SATA drives

Peripheral Drive Bays
One (1) 3.5" floppy drive

Expansion Slots

One PCI-Express x8 slot, one PCI-Express x4 slot, two 64-bit 133 MHz PCI-X slots, two 64-bit 100 MHz PCI-X slots (one functions as a ZCR slot for the X7SB4) and one IPMI slot

Motherboard (5025M-4/5025M-T)

Model: X7SB4/X7SBE
Form Factor: ATX
Dimensions: 12 x 9.6 in (305 x 244 mm)

System Input Requirements

AC Input Voltage: 100-240V AC
Rated Input Current: 6A (115V) to 2.7A (230V)
Rated Input Frequency: 50 to 60 Hz

Power Supply

Rated Output Power: 400W (Part# PWS-401-2H)
Rated Output Voltages: +3.3V (25A), +5V (30A), +12V (32A), -12V (0.5A), +5Vsb (4A)

BTU Rating

2185 BTUs/hr (for rated output power of 400W)

Chassis

5025B-4:
Model: SC822S-400LP
Form Factor: 2U rackmount
Dimensions: (WxHxD) 16.7 x 3.5 x 25.7 in. (425 x 88 x 652 mm)

5025B-T:
Model: SC822TQ-400LP
Form Factor: 2U rackmount
Dimensions: (WxHxD) 16.7 x 3.5 x 25.7 in. (425 x 88 x 652 mm)

Weight (5025B-4/5025B-T)

Gross (Bare Bone): 50 lbs. (22.7 kg.)

Operating Environment

Operating Temperature: 10º to 35º C (50º to 95º F)
Non-operating Temperature: -40º to 70º C (-40º to 158º F)
Operating Relative Humidity: 8% to 90% (non-condensing)
Non-operating Relative Humidity: 5 to 95% (non-condensing)

Regulatory Compliance

Electromagnetic Emissions:
FCC Class A, EN 55022 Class A, EN 61000-3-2/3-3, CISPR 22 Class A

Electromagnetic Immunity:
EN 55024/CISPR 24, (EN 61000-4-2, EN 61000-4-3, EN 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-4-8, EN 61000-4-11)

Safety:
EN 60950/IEC 60950-Compliant, UL Listed (USA), CUL Listed (Canada), TUV Certified (Germany), CE Marking (Europe)

California Best Management Practices Regulations for Perchlorate Materials:
This Perchlorate warning applies only to products containing CR (Manganese Dioxide) Lithium coin cells. “Perchlorate Material-special handling may apply. See www.dtsc.ca.gov/hazardouswaste/perchlorate”

Notes